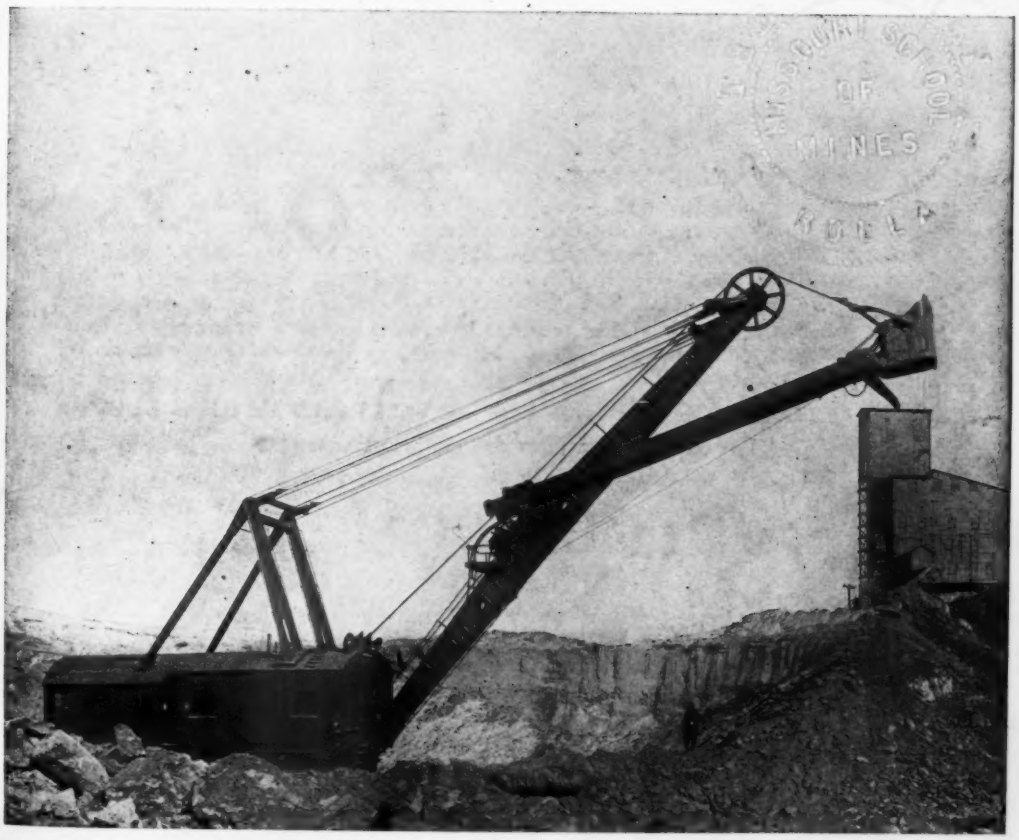
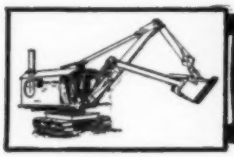
621.86
8Ex2

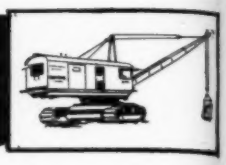
The Excavating Engineer

Vol. XV No. 7 JULY, 1921

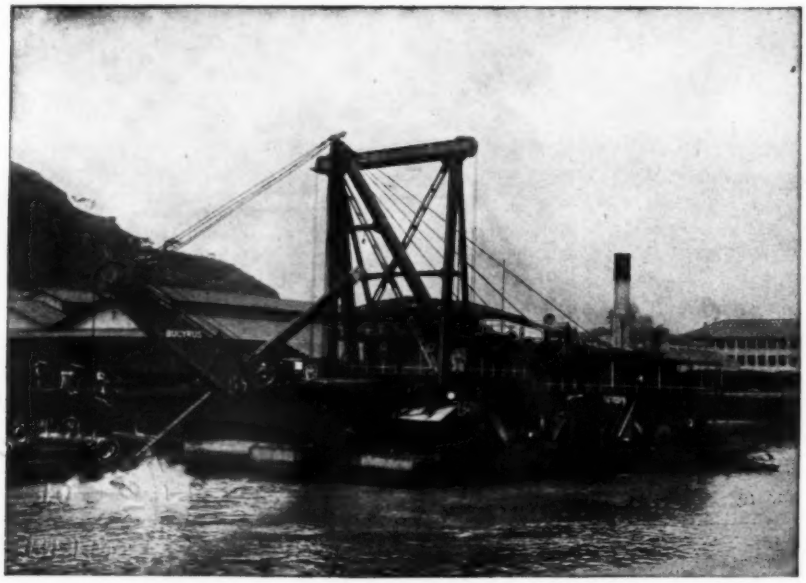




BUCYRUS



THIS DIPPER DREDGE—



The "Cascadas" is one of the three Bucyrus 15 cubic yard dredges that fought and conquered the slides that threatened the success of the Panama Canal. In February 1916 the "Cascadas" smashed all world's records by digging 23,305 cubic yards in 23 hours and 15 minutes, (1,002 cubic yards per hour) and 330,605 yards of rock and earth in 29 days. It is here shown deepening the berth at Balboa for the U. S. S. "Pennsylvania."

During the past fiscal year the three Bucyrus dredges, working an average of 8⅔ months each, excavated a total of 2,551,460 cubic yards, 1,371,225 cubic yards of which was rock.

FOR STEADY OPERATION, HIGH OUTPUT AND LOW UPKEEP UNDER THE MOST EXACTING CONDITIONS, YOU CAN DEPEND UPON A BUCYRUS.

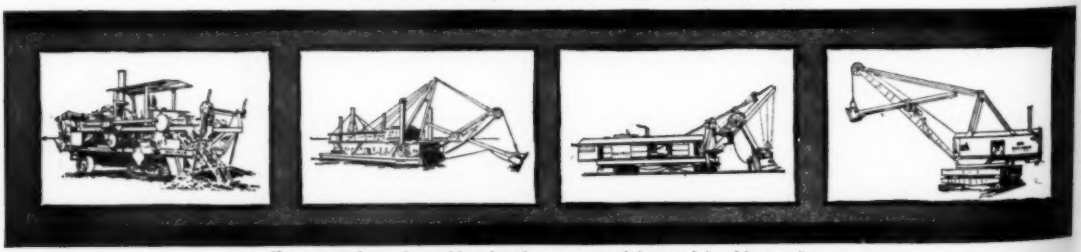
Let us figure on your dredge requirements.

Send for Dredge Catalogue N-S

BUCYRUS COMPANY

South Milwaukee, Wisconsin

For List of Offices and Representatives See Last Page This Issue



For convenience in making inquiry use postal inserted in this number.

Western 4-yard Cars at the Dump. Stripping Operation, Floridin Co., Quincy, Florida.

Mining Fuller's Earth, Western 4-yard Cars, Quincy, Florida

STEAM shovel operations at Industrial Plants more and more are depending on Western Dump Cars to solve the haulage problem and keep down costs.

An Ohio quarry increased its stripping 50 per cent by installing scientifically designed Westerns in place of ordinary dump cars.

A Pennsylvania quarry, stripping shale with Western 4-yard cars, dumps a 6-car train in from 19 to 25 seconds.

For plant haulage of all dumpable material, as well as general excavation, Western Dump Cars can be depended upon to increase production and lower costs.

All practical sizes from 1 cubic yard to 45 cubic yards capacity.

Maybe our engineers can help you with your haulage problem. Illustrated magazine describing the operations mentioned and pictured above will be sent on request.

Western
that's why

WRITE TODAY

Western Wheeled Scraper Co.
Earth and Stone Handling Equipment
Aurora, Illinois

For convenience in making inquiry use postal inserted in this number.

Class-24 Bucyrus steam dragline starting work on the Englewood Dam in May 1918. This machine is excavating earth and rock for the concrete outlet conduits. The material was hauled away in dump cars and wasted.

This view was taken about a month later. It shows the work further advanced. The Stillwater River is shown at the right.

The Excavating Engineer

Vol. 15 JULY 1921 No. 7

Dragline Work on the Englewood Dam, Miami Conservancy District

Brief Description of the Work Under Way on the Miami Conservancy District, Involving the Construction of Five Earth Dams and the Excavation of 18,000,000 Cubic Yards of Material, with a More Detailed Account of the Building of the Englewood Dam

The Miami Project—Its Reason

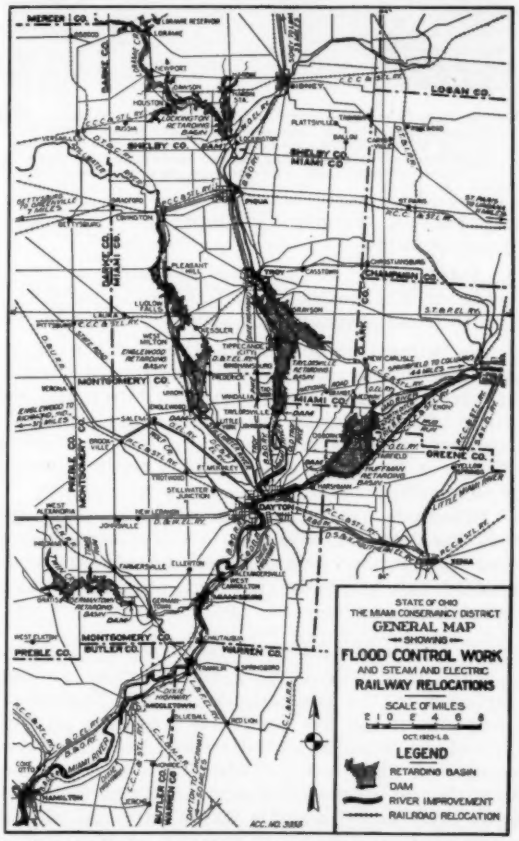
ON the night of March 24, 1913 a flood swept over that great fertile region in Ohio, known as the Miami Valley, dealing death to hundreds of persons and causing a property loss of many millions of dollars. The devastation that followed has no parallel in history.

Out of the mud and ruin of that flood, however, arose a spirit seldom equaled. The citizens of Dayton and the stricken towns of that valley, called Arthur E. Morgan, a noted engineer of Tennessee and under his leadership evolved a plan which will make certain that future generations of the Miami Valley are safe from floods. With the usual opposition of politicians, a law was passed making possible the Miami Conservancy District, and without State aid or Federal appropriations, the Ohioans are putting across a job which is said to be the greatest engineering project undertaken by Americans since the Panama Canal, and the greatest flood-prevention work in the history of the World.

The Project as a Whole

The purpose of the project, is, of course, the protection of the property of the Miami Valley from any repetition of this flood.

Investigation showed that the river channels through the cities of the valley had a capacity of less than one-third of what would be required to carry another flood like that of 1913. Deepening channels alone would not suffice; a great system of levees would not be practicable. The plan eventually decided upon consisted of a series of five great earth dams each forming an immense reservoir, capable of holding a total of 841,000 acre feet of water, or approximately 60% of the total amount of water that passed down the valley during the four days of the 1913 flood. Under the base of each dam is a permanent conduit. Through these conduits only enough water can pass to enable the completed work to control a flood 40 per cent greater in volume than that which took place over eight years ago.



Map Showing Flood Control Work and Railroad Relocation Being Carried On by the Miami Conservancy District

Active work started on the project in 1918 after five years of investigation and study.

The excavation will, in round numbers, amount to over 18 million cubic yards. This yardage,

Bucyrus Class-24 steam dragline excavating for outlet conduits. This photograph was taken in September 1918 and shows clearly the character of the material which consists of Cincinnatian shale the upper layers of which were dug without blasting and the lower layers blasted and excavated by this machine.

according to engineers' estimates will be apportioned as follows:

Dams .....8,500,000 cubic yards
River Excavation...7,500,000 cubic yards
Railroad Relocation 2,150,000 cubic yards

An interesting feature of this great work is, that here has been shown, in perhaps a greater measure than ever before, the flexibility and the utility of the dragline excavator. Upwards of 21 have been employed with booms ranging from 40 to 135 feet in length, twelve of which being operated by electricity.

Draglines are being used exclusively on the work incidental to the dam construction and for river excavation, the railroad relocation being handled for the most part by standard steam shovel method.

Method of Constructing Dams

This article deals with the dragline method employed in the construction of the Englewood Dam, one of the five earth dams on this project, their object being, as stated, to hold back the excess water over that amount which can be accommodated in the improved channels through the cities below, and to deliver this water automatically at a retarded rate, so as to prevent overtopping of levees.

All five dams are being built by the hydraulic fill method, this being the cheapest and most effective under the circumstances.

In considering the method of excavating the material in the borrow pit and transporting it to the dam, recourse might have been made to dredge, cableway, steam shovel or dragline excavator. Steam shovels were eliminated at the start because of the condition of the valley bottoms where three of the borrow pits are situated, and as between the three remaining methods, the dragline had decided advantages and was accordingly adopted. These advantages lay principally in the ability of draglines to dig to great depths whether in water or not and to deposit the material at great distances from the point of excavation, and furthermore, in their ability to load cars as effectively as steam shovels. Many other advantages were brought forth on other phases of the Conservancy work not touched by this article.

The Englewood Dam

The Englewood Dam is being constructed across the Stillwater River about nine miles northwest of the junction of that river with the Miami River at the northern limits of the city of Dayton. It is 4,700 feet long and has a maximum height of 124′ where it crosses the old river channel. The extreme width at its base is 1,200 feet, the top width will be 25 feet and is designed to accommodate the National Road. This dam will contain 3,590,000 cubic yards.

Two Class-24 Bucyrus draglines, one electric and one steam, equipped with 85 ft. booms and 4½ cubic yard buckets, and one Lidgerwood Class-B steam dragline are excavating the material from the borrow pit.

Another view of excavation on the outlet conduits taken in July 1918. The rock is alternating layers of limestone and shale. The bottom of the excavation is about 30 feet below the river bed. The excavation for the floor and foundations is nearly completed.

The material is loaded into trains of five 12-yd. Western air dump cars, hauled by 40-ton, 14″ x 22″, four wheel, saddle-tank, standard gauge locomotives built by the American Locomotive Company. The material is transported from the borrow pit in these trains to the dredge pumping plant where it is dumped from a trestle into what is termed a "hog box" from where it is sluiced by 3″ nozzles into dredge pumps. These pumps are 15″ centrifugal pumps operated by 500 H. P. electric motors. The material is pumped through a 15″ dredge pipe line into the dam.

Three small Marion draglines are also used in connection with this dam; two for throwing up levees in advance of pipe lines on the top of the dam and one for excavating gravel for concrete aggregate. One Class-24 Bucyrus electric was used for constructing a cross dam during the first phase of the work, but has been transported to one of the other conservancy projects.

Outlet Conduit Excavation

Work was started in the Spring of 1918. This consisted mainly of the construction of the concrete outlet conduits which will carry the river underneath the dam. The Class-24 Bucyrus steam dragline was used for this purpose and loaded into trains similar to those used at the borrow pit; the material being hauled was wasted.

In addition to this, the top soil of the dam site was stripped and a cut-off trench was dug along the center line of the dam. This was later filled with the impervious core material in order to prevent seepage.

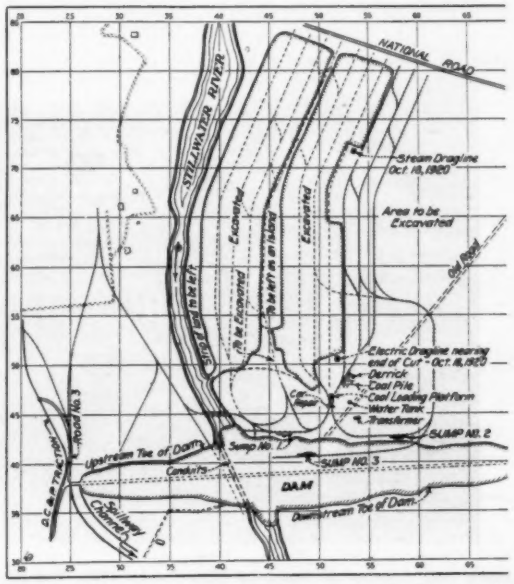
Building the Cross Dams

During 1918 the work was also started on the first cross levee. In order to explain the purpose of the cross levees, it might be well first to describe in brief, the method of building the embankment. The great width of the Stillwater Valley at this point makes the dam so long that its entire length cannot be carried up to a safe elevation in a single season and as a result the dam has to be built in three sections, one after the other, each being carried up so rapidly during a single summer season that by winter the working sections may be above the danger point, as it is in the winter and early spring when the worst floods occur.

The conduits are not large enough to pass the greater floods without impounding considerable water in the basin. This would be liable to overtop and destroy the uncompleted portion of the dam, therefore a gap in the embankment must always be left through which flood waters can flow without damage. As the portion of the dam adjacent to this gap comes to an abrupt end provision must be made for preventing the semi-liquid core forming the central portion from flowing out into the gap. The purpose of the cross dams is to provide this seal. They are nothing more nor less than earth retaining walls built across the dam, conforming in every respect to the earth classification of the main dam, but built in 6″ rolled layers instead of by the hydraulic process.

We publish on page 235 a sketch showing the cross section of cross dam No. 1 which is similar to the other dams constructed.

The method of constructing these dams was to bring the material from the borrow pit by train and dump it into a pit alongside of the track. The Class-24 dragline would pick this material up and distribute it on the dam as illustrated herein. A



Map of the Englewood borrow pit October 1920. This should be studied in comparison with the photograph on next page. 2,300,000 cubic yards of material have been taken from this pit. The squares are 500 feet on a side. The left hand excavated area was taken out in 1919, being a little short of 900,000 cubic yards. With the exception of one short strip, the right hand area was taken out in 1920 in amount about 1,300,000 cubic yards.

small amount of hand work prepared the 6″ layers for the steam roller.

The dragline followed up with the dam to elevation 805 where it remained on the berm passing the material to the higher portions of the dam. The Class-24 was fitted with a 135′ boom and 1½ cubic yard bucket for this work.

Embankment Construction

The real work of embankment building began in April 1919 during which year about 900,000 cubic yards were put into the east section of the dam. During 1920 the center section was built, over 1,300,000 cubic yards being placed. During this year work is being cencentrated on the third or west section, and over the entire length when the dam shall have become level from end to end. The work at the present time is a little over two-thirds completed as will be seen.

The Borrow Pit

The borrow pit for the Englewood Dam lies upstream from the dam, covering about 200 acres. The depth of the excavation averages from 15′ to 20′.

As may be seen from the sketch, the tracks are laid running north and south through the borrow pit, and successive cuts progress from the west to the east. The tracks were laid with 150 feet on centers and the material for the dam is being excavated by two Bucyrus Class-24 draglines, one

General view of borrow pit excavation taken October 1920. This photograph should be compared with the map. This view shows the water tank, the coal loading platform and derrick, and the car repair shop. The Class-24 Bucyrus electric dragline is just finishing this cut. In the background may be seen the Class-24 Bucyrus steam dragline which is about half way down the cut. The Lidgerwood dragline in the fore ground is excavating material for the dam. This picture is taken from the slope of the dam now under construction.

Another view of the borrow pit work showing the Class-24 Bucyrus electric dragline loading cars. The cut carried was about 150 feet wide and averaged 20 feet deep, about 5 feet of which was below water. The Class-24 steam machine is shown in the background.

steam and one electric. Another smaller steam dragline is at work in the borrow pit excavating material for concrete aggregate.

The draglines are usually spaced about 1500 ft. apart along the cut. In this manner one reaches the middle of the cut as the other reaches the end. Each moves to the new cut about the same time.

The method of operating the trains is as follows: One train stands at each dragline. As the train at the northerly dragline is loading its next to the last car, the engine runner blows his whistle. At this signal the train at the southerly dragline proceeds to the northerly dragline. The time of loading the last car at the latter allows time for this move so that as the loaded train moves out, its place is immediately taken by the other and the dragline is not delayed. There are six trains in service and the empties proceed directly from the pumps to the southerly dragline, waiting there for the trains to be loaded and move ahead. Should it happen that a train at the southerly dragline is fully loaded before a signal comes from the northerly dragline, it moves directly to the pumps by means of a crossover from the loading track. As the empty trains return from the pumps they pass the coaling and watering station and take on fuel as required.

Output of Draglines

The best dragline performance is the loading of 274 twelve-yard cars in a 10-hour shift by the Class-24 Bucyrus steam dragline. A car is ordinarily filled with three buckets full which involves 822 cycles per day. During this performance the swing ranged from nothing to 180° and averaged 90°. This output was made on July 15, 1920, and has been equaled since on two occasions. The dragline was loading 5-car trains, the haul was about

Class-24 Bucyrus electric dragline at work in the borrow pit in the latter part of July 1919

5000 feet and an equal distance return, the cut was 150 feet wide and averaged 20 feet deep. The material was a mixture of sand and gravel overlaid with 2 to 4 feet of fertile sandy loam. About 5 feet was below water. The average monthly output for each dragline, working two 10 hr. shifts, is a little over 75,000 cubic yards.

We publish herewith a table showing the dragline performance in the Englewood borrow pit during the season of 1920.

Dragline Performance on Englewood Dam—Season of 1920

BUCYRUS CLASS-24 STEAM DRAGLINE

	Total Working Time—Hours	Actual Digging Time—Hours	Time Lost—Hours	% Delays	No. of Cars
April	490	466:45	23:15	4.7	5,666
May	500	491:25	8:35	1.7	8,396
June	520	499:40	20:20	2.6	9,142
July	520	479:30	40:30	7.8	9,809
August	520	463:10	56:10	10.8	9,270
September	500	455:20	44:20	8.9	8,948
October	400	356:55	43:05	10.8	6,759
November	470	401:55	68:05	14.5	7,035
December	340	320:20	19:40	4.8	5,452
Total Number of Cars, 9 Months					70,477
Cars per hour, Digging					17.9

BUCYRUS CLASS-24 ELECTRIC DRAGLINE

	Total Working Time—Hours	Actual Digging Time—Hours	Time Lost—Hours	% Delays	No. of Cars
April	460	438:30	21:30	4.7	6,325
May	500	476:25	13:35	2.8	8,578
June	520	488:35	31:25	6.1	9,016
July	520	425:45	94:15	18.2	8,085
August	520	484:35	35:25	6.8	8,904
September	500	454:00	46:00	9.2	8,547
October	390	359:15	35:45	7.9	5,700
November	480	446:35	33:25	6.9	7,798
December	340	332:25	7:35	2.2	6,188
Total Number of Cars, 9 months					69,141
Cars per hour, Digging					17.4

The 12 cubic yard cars used build about 8.5 cubic yards of dam each.

Based upon fifteen months of operation in 1919 and 1920, the Class-24 Bucyrus steam dragline consumed 351.2 pounds of coal per hour under steam or a total of 14,091 tons in the fifteen months.

One point of interest gathered from the engineer's data is that it has been the experience with over 2,000,000 yards that a 4½ cubic yard dragline bucket builds three cubic yards of finished dam.

The work at Englewood is in charge of H. S. R. McCurdy, Division Engineer, to whom we are indebted for the above information; H. W. Horne, Assistant Division Engineer; Richard Byers, Superintendent of Construction; Kirby Jones, Assistant Engineer and Inspector; William Pennington, Night Superintendent and Peter Haskel, Master Mechanic.

Much of the credit for the efficient procedure of this work is due to the high state of efficiency at which the plant equipment is kept at all times and to the wholesome spirit in pride of achievement which has been instilled into the men.

Retirement

"What is your occupation?" asked the judge, sternly.

"I haven't any," replied the man. "I just circulate around, so to speak."

"Please note," said the judge, turning to the clerk, "that this gentleman is retired from circulation for thirty days."—*Moonbeams.*

Bucking Snow Drifts Through the Cascades with a Steam Shovel

Describing How Boss and Hampshire Opened the Sunset Highway Through Snoqualmie Pass 60 Days Earlier than Usual by Means of a Caterpillar Mounted Steam Shovel, Moving 140,000 Cubic Yards of Snow in a Month

ONE of the most important east and west highways in the State of Washington is the Sunset Highway, which crosses the Cascade Mountains through Snoqualmie Pass at an elevation of about 3000 feet. During the winter season this road is impassable on account of the deep snow. This does not melt out sufficiently for traffic to go through until late in June or July.

An Unusual Use for a Steam Shovel

This year, however, the State Highway Department decided to clear the road through the highest part of Snoqualmie Pass, where the snow was deepest.

Boss & Hampshire, the well-known Pacific Coast contractors, took the contract for clearing the pass and used for the job an 18-B Bucyrus revolving shovel mounted on caterpillar traction.

Description of the Job

The job consisted of a stretch of eight miles of road to be cleared on the summit of the pass, five miles in Kittitas County and three miles in King County. Over this distance the snow averaged seven feet in depth and was hard packed—due to melting and settling which was constantly going on.

Cutting through the drifts with a specially constructed 3½-yard dipper. With this dipper 140,000 cubic yards of snow were moved in a month.

Work was begun on April 10th and the eight-mile stretch of road was cleared by May 10th. The snow was removed to a width of 14 ft. The total amount of snow handled by the shovel was approximately 140,000 cubic yards, or over 4000 cubic yards per day.

The 18-B Bucyrus at work in eight feet of snow on Snoqualmie Pass. Eight miles of road were cleared to a width of 14 feet.

A Big Dipper for a Small Shovel

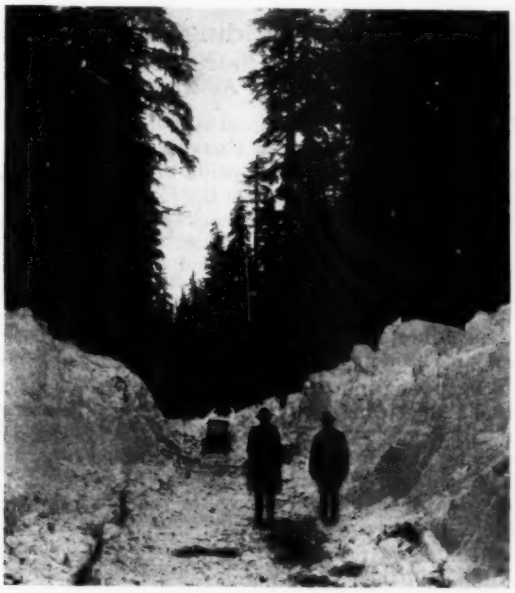
It was apparent that a standard dipper would not do the work required on this job. The standard ⅞-yard dipper with which the machine was equipped was too small to handle snow economically, and because of its rectangular shape the snow would not fall out easily when the dipper door was tripped. To overcome these difficulties Mr. M. S. Boss had a dipper built approximately 4 ft. by 4 ft. by 5 ft. 8 in. This gives a capacity of approximately 3½ cubic yards. In order to make dumping easy the dipper was built with a one-inch increase in width for each foot in depth, from top to bottom. This design readily permitted the dipper to clear itself of snow, and made it possible to handle the snow rapidly.

Digging Snow with the ⅞-yard Dipper Before the 3½-yard Dipper Was Put on the Job

Value of Caterpillar Mounting

In carrying out this work the feature which made this use of a steam shovel successful was the caterpillar mounting with which the shovel was equipped. This type of mounting worked very well on snow, and in places where the depth of the snow was so great that it was not possible to swing the dipper around, the shovel was able to climb up on the snow without sinking in to any extent. From the time of starting the shovel up to the work, to the date of finishing the job, the shovel traveled over 30 miles under its own power. The greater part of this distance was, of course, covered in getting the machine up to the eight miles of road to be cleared.

This Gives a Good Idea of the Comparative Size of the Standard ⅞-yard Dipper with Which the Shovel Was First Equipped, and the Special 3½-yard Dipper Which Was Used for Most of the Work



How would you like to change places with the two gentlemen in this picture one of these hot days? They are Mr. M. S. Boss of Boss & Hampshire, and Mr. C. T. Jordan, Division Engineer of the State Highway Department of Washington.

In former years teams and scrapers were used to open the road, and it has often been as late as July 1 before traffic through Snoqualmie pass was possible. This year due to the use of the steam shovel the road was cleared before the middle of May.

Mr. Charles T. Jordan, Division Engineer of the State Highway Department of Washington deserves much of the credit for getting this work under way. He persuaded the County Commissioners of King and Kittitas Counties that Sunset Highway could be cleared in a rapid and economical manner by the use of a steam shovel, and the results have in every way justified his expectations. The efficient caterpillar mounting of the Bucyrus shovel proved very valuable on this unusual job. This shows again the remarkable adaptability of caterpillar traction to all kinds of work.

Mr. M. S. Boss was in charge of the work and John Jackson was the foreman on the job. Joe Coxon at the levers steered the Bucyrus through the drifts while Charley Rachnor kept the boiler hot.

"Mounding" for the British Ministry of Munitions

Description of the Construction of the Greatest Propellant Explosive Plant in England, and the Part American Dragline Excavators Played in the Work

NOW that the heavy curtain of censorship has been lifted, that cloaked with a veil of mystery every operation of interest in our country, in England, and on the Continent, we are gradually learning of vast works that were pushed through those dark years of war under high pressure, with the safety valve tied down. Many of these operations developed new processes, many led to the successful employment in new fields, of machines, which under normal conditions would not have been given the test for many years to come.

Prominent among these new applications is the use of American excavating machinery in England, and it is of interest to observe that our English cousins have in many instances handled our own machinery in a manner which might be a source of pride to the oldest veteran of the earth moving game in this country.

The description that follows is an excellent example of the case in point.

Gretna Green and H. M. Factory, Gretna

On the border between England and Scotland where the Solway Firth takes a long bite into the west coast line of Great Britain, there is a small town, made famous in literature for many runaway marriages, named Gretna Green. Early in 1916 this town became the center of the greatest propellant explosive plant in England, if not in the world, by the creation of H. M. Factory, Gretna.

This factory occupies an area of approximately 15 square miles. Work was commenced about the middle of 1915, and the factory was completely finished eighteen months thereafter.

The Mounds

One of the most important sections of the factory was that devoted to the production of nitroglycerine for which purpose about 50 separate and distinct buildings were constructed, each surrounded by an earth mound, to localize the effect of an explosion in any one of them. The height of these mounds was generally from 18 to 22 ft., but in one or two cases a greater height of 28 ft. was necessary. The width at the top was from 4 to 5 ft. and the slope of both the interior and exterior sides was 1½ to 1. These buildings varied in size, but the average was 40 ft. x 30 ft. plus a 4-ft. encircling path, thus giving an average perimeter to the toe of the mounds of about 170 ft., and making the internal dimensions of the mound 48 ft. by 38 ft.

Dragline Operation

For the construction of these mounds, two Bucyrus dragline excavators were employed, both mounted on caterpillars, viz., one Class-9½ and one

"Mounding" underway. Class-9½ Bucyrus dragline to left building a mound around one of the nitro-glycerine buildings. Class-14 to right.

Class-14, steam operated. These machines had a digging and dumping radii respectively of about 45 ft. and 65 ft. In general, the draglines borrowed the soil from immediately adjacent to each mound, and dumped it in the required positions.

Re-handling of Material—Output of Class-14

Part of the ground was of very swampy nature, and to obviate deep pits around the mounds, which would inevitably become full of water, the excavation in such cases did not exceed from 2 ft. to 2 ft. 6 inches in depth. This necessitated in many

Another view of the mound construction. Class-14 Bucyrus dragline in foreground. This machine operated over soft ground, consequently planks were at times necessary under the caterpillars as here shown.

cases handling the material twice. The draglines would excavate and dump a calculated quantity of spoil at a convenient distance from the site; they were then moved nearer to the building and re-handled the spoil they had previously dumped. The larger machine, the Class-14, was the one principally used for this re-handling and in spite of this re-handling, it had no difficulty in constructing two mounds a week, each of which may be taken as containing 2500 cu. yds. This was a remarkably good performance, representing 5000 cu. yds. per week, twice handled, say 10,000 cu. yds. actually. The working day was 9 hours.

Operation of Class-9½

The Class-9½ dragline was found to be the more suitable size by reason of its greater mobility and handiness. It was principally employed in digging hard red marl, giving an output of from 500 to 1000 cu. yds. per day. The material and its location was more favorable than that in which the Class-14 was digging, enabling the contractors to move the machine much less frequently than the Class-14. The Class-9½ regularly dug down to 20 ft. in depth.

The Contractors

The managers of H. M. Government and the construction of the whole factory, were Messrs. S. Pearson Sons, Ltd., the construction of the "Mounds" was under the supervision of Messrs. Nowell & Thompson, Contractors, who commenced operations at the factory in January 1916, and the dragline excavators arrived there shortly after, and were erected in about six weeks, enabling them to be put to work early in the Spring of 1916. In about eight months these machines excavated from 250,000 to 300,000 cu. yds. Many of the mounds were completed by July 1916, and nitro-glycerine was actually manufactured in the buildings surrounded by them in the same month.

Success of Dragline Operation

In spite of the bad nature of the ground which existed, the Class-14 machine having to operate on timbers, the work proceeded smoothly and expeditiously, and the contractors speak highly of their efficiency.

These mounds were generally built on sloping ground, but no difficulty was experienced with the machines, and the usual practice was followed by levelling off the spot from which they dug. The re-handling, above referred to, effected great saving in time and rendered unnecessary the use of light railway which would have been otherwise necessary in order to bring the requisite amount of spoil to the sites of the mounds.

Oh, When We Get to Heaven

By T. M. Morrow

Oh, When we get to heaven beside the crystal sea,
Come, tell me, parson, answer this for me.
Won't there be nothin' else to do than twiddle a harp-string
Or set down in a golden chair to hear the angels sing?
No piles to drive; no concrete poured;
No smoky tunnels to be bored;
No rock to shoot up to the sky;
No cofferdams to keep things dry;
No gin poles rigged; no scaffolds raised;
No fancy brickwork to be praised;
No steel work its right place to give;
No red-hot rivets to be driv'?
Won't there be buildin' done at all beside the crystal sea?
Come, tell me, parson, answer this for me.
For what's the use of buildin' men where everything's complete?
Come, tell me, parson, answer this for me.
Will all them gates of pearl be hung and plumb and swingin' right?
Will all them streets of gold be paved with sewers out of sight?
When everybody, big and small,
Drops in their checks for good and all,
Will everything just pass away
That went to make a workin'-day?
Me, that's built plumb and square and true
A whole long life of livin' through,
If, when I get beyond the sun,
There ain't no buildin' to be done—
Why, what's the use of dyin' till the whole job here's complete?
Come, tell me, parson, answer this for me.

—*Adventure.*

If there isn't any Hell, then where has business gone?

Instead of using profane language a woman gives a cursory glance.

The Excavating Engineer

A Monthly Publication Devoted to Excavating and Allied Subjects

Subscriptions, payable in advance, $1.00 a year for 12 numbers, 50 cents for six months.

To foreign countries, including postage, $1.00 a year, 6 shillings or 10 francs.

Advertising copy should reach this Office by the 10th of the month before date of issue.

THE
EXCAVATING ENGINEER PUBLISHING CO.
Bradlee Van Brunt, Manager and Editor
South Milwaukee, Wisconsin

Pueblo and Miami

It is a coincidence that this issue of The Excavating Engineer should carry as its leading article, a description of that gigantic engineering undertaking which the citizens of Ohio are so successfully prosecuting with an end to prevent forever the repetition of the devastating flood that laid waste to the Miami Valley in 1913.

As we go to press, Central Colorado is still taking toll of its terrible disaster. Five hundred lives have been lost and upwards of $25,000,000 of property has been destroyed. Pueblo, the second largest city in the State, was the heaviest sufferer, but the flood and destruction covered a wide extent of territory, embracing the headwaters of the Arkansas and South Platte Rivers. The cause was just such a storm as struck Ohio and Indiana eight years ago, a large-area rainfall of great total depth followed by the conjunction of enormous volumes of water, swelling rivers and destroying dams.

Although sufficient time has not elapsed to permit detailed reports of the causes of this flood to be given to the public, such information as has come to hand seems to indicate a certain parallel to the conditions that prevailed at Miami.

The careful and detailed engineering studies which followed the Miami flood showed these rainfalls to be rare, and to put it in the class of an epochal storm. The same appears to be true of Pueblo. In both cases lesser floods in previous years led to the construction of dams and levees here and there to protect certain local districts, but in neither case had this work taken the form of a general project.

The Arkansas River is a mountain stream fed by many creeks. The soil through which it flows, especially near Pueblo, is clay, baked hard by the sun. An exceptionally heavy rainfall occurred over a very wide area. This precipitation was said to be 2.92 inches in Pueblo in 24 hours and greater still further up the Arkansas River. The sun-baked soil was ideal for a rapid run-off of water. The first heavy downpour at Swallows, twenty miles up the Arkansas, came too fast for the soil to absorb. The first thin sheet that flowed down the valleys moved slowly because of the natural friction of a shallow stream. This held the water back, acting like a dam. This first rainfall was then followed by another heavy precipitation which overtook the first. Consequently, about four hours after the first downpour twenty miles up the river, Pueblo was hit by a wall of water ten feet high, sweeping away dams, bridges and buildings.

This is what appears to have happened at Pueblo, judging from newspaper dispatches. The conditions in the Miami Valley were somewhat similar. Before the mud had dried the citizens of that valley had engaged the greatest obtainable expert on flood control and had proceeded to map out a comprehensive program of work, which ignored all selfish local interests, politics and the pork barrel. The result is a flood control project said to be the greatest ever undertaken, but what is more, one that assures the citizens of that fertile valley that their children and their children's children are safe from a repetition of such a disaster for all time.

The engineers of the Miami Conservancy District have done many things incidental to their great object. They have, by their studies and investigations, increased the effectiveness of engineering works that ultimately must be the reliance against a recurrence of such a flood disaster, and they have developed methods of construction invaluable to posterity. Not the least among these new methods is what they have shown the engineering world in regard to the dragline excavator, which happens to be the main theme of our leading article in this issue.

It is to be hoped that the people of Pueblo and the other stricken towns will be imbued with the same splendid spirit that has strikingly characterized the people of the Miami Valley. Such a commendable spirit deserves to win; it has in Ohio and it will again in Colorado.

Construction is Picking Up

According to figures compiled by the Engineering News Record, the first week in June was the record week for the year in the value of contracts let. During this week contracts totaling $44,922,017 were let. This is 60 per cent in excess of contracts let for corresponding week in 1920. This should give pessimists something to think about.

A recent official report places the iron ore resources of Tasmania so far at present investigated, at 41,900,000 tons.

· FIELD NOTES ·

Hazards of Steam Shovel Work—How They May Be Prevented

(Continued from June Number)

Overturning of Shovel

"Another kind of danger, although happily an infrequent one, is that of the shovel upsetting. This arises mainly from the slippage of the blocking, the breaking of an arm or brace while the shovel is in operation, or from the shovel getting beyond control of the runner when the jacks are loosened so as to permit of moving up. Accidents of this sort are hard to guard against and endanger the lives of the entire crew."

Loading Cars

"It is not always possible to load strip-pit cars so that they will dump as soon as the bodies are released. In case the load is not satisfactorily placed in the car the men on the dump are apt to roll stones over till the balance is adjusted and if they have already released the car body and not refastened the chains the car is apt to dump its man and all over the bank."

Miscellaneous Dangers

"Bursting of steam pipes and the blowing out of joints also are frequent causes of accidents around steam shovels. Coincident with an operation of this kind there are also innumerable minor accidents, such as cut and bruised fingers, hands and feet. Some are caused by blows from hammers and pinching by bars and others result from handling rocks in the pit or occur in the dressing down of high banks that the shovel has been unable to reach."

Runaways

"Then again trips are apt to run away by reason of broken couplings or from the failure of the brakes to hold back the cars when the rail is slippery. As a preventive measure the engineer should be ordered to inspect the couplings on his cars at least once a day and should be cautioned to use care and judgment at all times in handling his train."

Coupling

"Probably the most frequent cause of injury in the transportation department arises from men getting their hands or fingers caught while coupling and uncoupling cars, nearly all stripping cars in the anthracite region being of the drawhead type with a single link-and-pin coupling. There also have been instances where men have been squeezed about the body while coupling cars, but such accidents have been rare.

Bumping a pole with a locomotive as a means of retracking cars is dangerous and should be discountenanced for men when trying to adjust the pole are frequently caught. It is better and safer by far to have every locomotive equipped with a pair of good retrackers for this kind of work."

How Men Dump Themselves Over Spoil Banks

Accidents on the spoil dump have been less frequent than in any other section of the operation, and the most serious ones have arisen directly from thoughtlessness on the part of the individuals themselves. In filling stripping cars the shovelman always endeavors to place a greater load on the dumping side, so that when the dump is reached and the dumping chains are released the car can be readily tipped. Sometimes, however, cars reach the dump loaded too heavily on the inner side, and when the chains are freed the men find that the cars will not discharge themselves. In several instances they have been known to clamber on the car to throw off some of the material on the heavy side, without remembering, however, that the side chains should be hooked before so doing. As a consequence the weight of their bodies overtipped the car and precipitated them to the bottom of the dump, some quite serious accidents resulting.

The most effective preventive for accidents of this character is to employ a short pointed dumping pole. This when placed on an angle between the floor of the car and the ground will permit the car to be tipped by merely moving the trip a few feet.

There also are numerous cases of men losing their balance and rolling down the dump while attempting to bar large rocks that have become lodged on being discharged from the car. Some of these accidents have produced permanent injuries and disfigurements. How many needless accidents occur yearly in open-cut mining it is hard to say, but if every one connected with this work would adopt the 'Safety First' slogan as his own it is certain that the number would be speedily reduced to a minimum."

Most Inconvenient

In the departed days a somewhat befuddled guest appeared unsteadily before the desk of a smart hotel and demanded in thick but firm tones that his room be changed.

"I'm sorry," the clerk humored him. "But all the rooms are taken."

"Mush have 'nother room," insisted the guest.

"What's the matter with room you have now?"

"Well, if you mush know," explained the dissatisfied tenant, "ish on fire!"—*American Legion Weekly.*

The Worst Pun

"Funny thing happened the other day," related Jones. "I was in one of those near-beer places and absent-mindedly asked for a manhattan cocktail."

"Did you get it?"

"No. The manhattant any."

—*American Legion Weekly.*

DEVICES YOU OUGHT TO KNOW ABOUT

A New Path Digging Wagon Loader

A new creeper equipped path digging wagon loader has recently been brought out by the Haiss Manufacturing Company. This machine must not be confused with the Haiss Path Digging Wagon Loader equipped with wheels as the new machine has been re-designed entirely and is a much heavier and stronger machine than the wheel equipped wagon loader.

The new machine is equipped with creepers which are 8′ 0″ long overall and 6′ 0″ long centers. The creepers are cast steel 10″ wide and of the self-cleaning type. They overlap to prevent dirt and foreign matter from clogging the sprockets. The creepers are built of heavy steel castings and the frame support has a three point suspension.

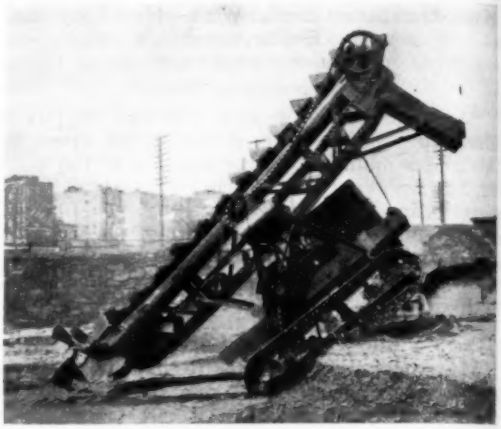
A 15 H. P. General Electric or Westinghouse motor is used, or a Waukesha engine, heavy tractor type, developing 37 H. P. at 1000 R. P. M. It is connected to the counter shaft by means of a Baldwin chain and through a gear which drives the elevator and also the wagon loader.

Heavy Digging in a Clay Bank

The loader has a forward speed of 75′ per minute, a reverse speed of 45′ per minute, and a crowding speed of 22″ per minute. The head shaft is of heavy chrome nickel steel supported by steel take-up bearings which can be adjusted to take up the slack of the chain. This loader is also equipped with extra heavy buckets on which are installed saw tooth cutting edges. The rear tail shaft is 3″ in diameter, squared to receive extra heavy steel lugs on which are bolted the heavy propellers.

This new loader is the outcome of approximately twelve months study and test. One of our photographs shows one of these machines excavating from a clay bank. This is really steam shovel work, and while the machine is not recommended for this particular heavy duty, it did the work very satisfactorily.

The blades on this machine are equipped with digging teeth. These teeth prove very satisfactory in cutting into material and makes this machine very satisfactory for digging sand and gravel from a bank.



Climbing an 18-inch bank. Note the rigidity of the creepers.

The overall height is 14′ 0″. The height under the chute is 8′ 6″, and when the elevator is collapsed the overall height is 9′ 0″.

For complete information write the Haiss Manufacturing Company, 141st Street and Rider Avenue, New York City, using one of the blank postals inclosed in this magazine.

A New Crawling Tread Crane

One of the latest and most modern designs of crawling tread cranes is the new O. S. Dependable manufactured and sold by the Orton & Steinbrenner Company of Chicago and Huntington, Indiana. The same standards and specifications as regards quality of material and workmanship under which the larger types of locomotive rail cranes are fabricated are embodied in this crawling tread machine. In fact the superstructure of it is proportionately identical with that used by the Orton & Steinbrenner Company in their heavier and larger capacity standard gauge rail types. Two sizes of cranes are made in the new design both being especially adapted to contractor's use; they are rated as 7-tons and 12-tons capacity.

It makes a very efficient piece of equipment for work in coal, sand and gravel yards and miscellaneous excavation for this class of service. It is entirely constructed on the interchangeable duplicate part system which makes repairs immediately available, thus minimizing loss of time due to inevitable breakages or worn out parts.

The details of construction are very simple and rugged. Surface area of crawling tread is great enough to reduce unit pressure on ground to 10 lbs.

UMI

per square inch—less than that produced by a 200 lb. man—although crane weighs in the neighborhood of 45,000 lbs.

The hoisting mechanism is designed mainly with a view to accessibility. For operating a bucket double automatic drums are regularly supplied; thus doing away with one set of levers with a consequent simplicity of operation. Frictions are made of bronze; no wood friction blocks are used whatsoever. The large braking surfaces insure quick action in lifting and releasing the loads and minimize wear.

Equipment for crane may be varied to suit the condition of the work. In addition to operating clamshell or orange peel bucket, turbine generating set can be installed and electro magnet operated, pile driver equipment attached, or fall block for handling heavy loads up to the maximum capacity of the crane. Dragline equipment for handling

The O. S. Dependable Crane

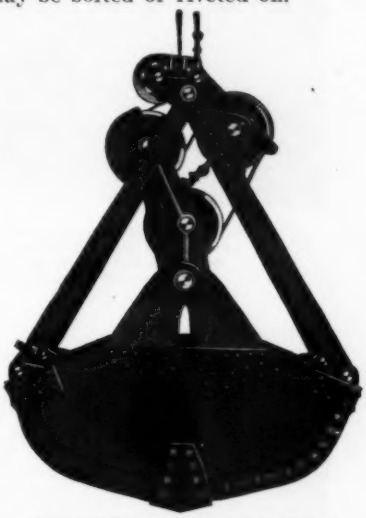
dragline bucket, pulling cars or otherwise using its greater tractive effort, are equally well accomplished. The standard 7-ton crane is equipped with 30′ boom, standard 12-ton is equipped with 35′ boom but extra lengths may be supplied. Crane can be arranged to operate on broad faced road wheels or on standard or special gauge rail tracks besides crawling tread.

Booklet giving a full description can be had by addressing the Orton & Steinbrenner Company at their main office, 608 South Dearborn Street, Chicago, Illinois, using for this purpose one of the blank postals enclosed in this magazine.

Clamshell Buckets for Light Excavation and Rehandling

The "Favorite" clamshell bucket manufactured by the G. H. Williams Company of Erie, Pennsylvania is an all-around contractor's and material-handler's bucket, suitable for light excavation as well as for rehandling all kinds of material.

This bucket is built entirely of steel, reinforced with a very substantial cutting lip. The design is such that the sheaves are in perfect alignment. This provides straight cable leads and reduces to the minimum wear on both sheaves and cables. The "Favorite" bucket can be equipped either with a cutting lip or forged high carbon steel teeth. Teeth may be bolted or riveted on.



Williams' "Favorite" Clamshell Bucket

The construction at the hinge pin is unusual, the two outer lugs being pinned to the main shaft. This causes the rotation due to opening and closing of the bucket to take place on the long bearings of the main arm casting. This rigid construction, together with the triangular construction of the

Williams' 3 Cubic Yard Bucket

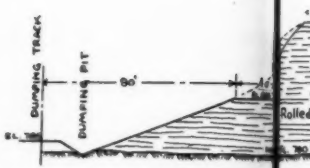
corner bars insures perfect alignment of the sides. and prevents the bucket from losing any of its load.

Williams buckets are made in all sizes from ½ to 5 cubic yards, and in all types to suit any digging or rehandling requirements. For detailed information write the G. H. Williams Company, Erie, Pa., using one of the blank postal cards inclosed in this magazine.

Class-24 Bucyrus electric dragline beginning work on the east cross dam in November 1918. The material for this dam was excavated at the borrow pit and transported in dump cars on the track shown in the foreground and dumped into the pit beside the machine.

Four months later. The C... cross dam. The Class-24 ... on the east end of the ... few days after the ... "hog box" is shown ... the oversize stones ...

No. 1 Cross Dam practically completed in December 1919. The dragline is working on the berm, filling it and making it a straight slope.

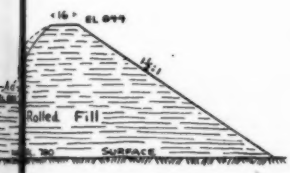


Cross section of Cross Da... Dam No. 223.

A detailed view of work on Cross Dam No. 2. This view shows clearly the dumping track and the pit in which the material is dumped for rehandling by the Bucyrus electric.

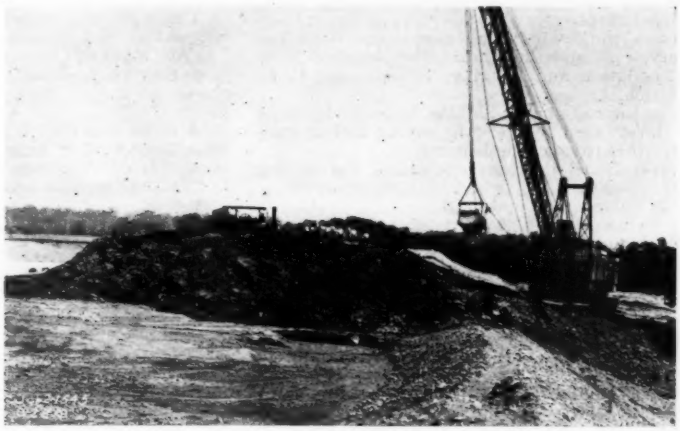
This series ...hows ically the ... const the cross d... Eng Dam, Miami ...cy I The purpose ...ross ... to seal the ... of th dam so as to ... sem core from ... described ful... 221

ground is at work on the
the background is at work
photograph was taken a
fill. The sump or
-leg derrick removes
through the pumps.



dam is identical to Cross
223.

How the work looked at the end of July 1919. The cross dam is further advanced. A Class-24 Bucyrus electric is passing the material to the higher part which is being rolled by a steam roller. The small Marion machines in the background are throwing up levees in advance of the pipe lines on the top of the dam.



A closer view of the cross dam construction shown in the previous view. The borrow pit material handled by the dragline is shown in a darker shade.

hows graph-
constructing
Englewood
cy District.
ross dams is
f the main
semi-liquid
t. This is
s 221-225.

This View of Cross Dam No. 2 Shows Clearly How the Dragline is Able to Reach to Far Corners of the Dam and Place the Material Where Desired

SHOTS FROM THE · FIRING LINE ·

Alabama

State Highway Dept., Montgomery, had plans prepared grading, draining and surfacing 10.75 mi. road from Greenville in direction of Ft. Deposit to Lowndes Co. line, 24 ft. wide, sand clay, Butler Co., about $55,000; 23 mi. Bankhead Highway between Anniston and Talladega, 24 ft. wide, chert or gravel, Talladaga Co.; 14.6 mi. Athens-Florence Highway from ½ mi. west of Athens to Lauderdale Co. line, 24 ft. wide, bituminous macadam, Limestone Co., about $390,000. W. S. Keller, Montgomery, state highway engr.

Canada

Eastern News

R. ST. JOHN, MONTREAL

G. C. Parker, of the Department of Highways, Ontario, has recently undertaken the duties of acting secretary of the department.

Construction work will soon be commenced on the $400,000 reservoir at Melville, Sask. The contracts have been let to Tomlinson and Fleming, Toronto, and C. L. Devail, Edmonton.

The Mining interests in the Shining Tree district want the Ontario Government to assist in having a light railway built into this part of the country.

The Ontario Legislature has authorized the raising of a loan of $20,000,000 of which $11,500,000 will be spent on roads during 1921 and 1922.

According to the estimate of Commissioner Harris, the proposed widening of Yonge St., Toronto, Ont., from Lawton Blvd. to the north city limits, will cost approximately $1,000,000. The widening would be made on the west side of the street.

Charles Evans Fowler, engineer in charge of the proposed international bridge connecting Windsor and Detroit, stated last week that he is now preparing to award contracts and that he expects actual work to begin within six months. Construction is expected to take at least six years and the cost will be close to fifty million dollars.

Fire completely destroyed the boiler shops of the National Shipbuilding Co. Maitland, Ont. The loss is estimated at $100,000, with about $75,000. insurance.

Contract was let to P. H. Secord & Sons, of Brantford, Ont., for the erection of the ten-story hotel for the United Hotels Co. at Windsor, Ont. Estimated cost $1,750,000.

The C. P. R. will build three new steamers to cost twenty-two million dollars.

Tenders are in for the completion of the work on the Montreal Aqueduct scheme. This work includes levelling and concrete construction work on both sides of the waterway. Tenders for work on the south bank range from $248,780. to $403,099. and on the north bank from $247,760. to $379,323. Bulk tenders for the entire work were from $491,323. to $782,321.

Following contracts were awarded by the Provincial Highways Department Toronto, Ont. Contract No. 206, culverts in township of Fitzroy, to Jas. Brennan, Arnprior; No. 207, culverts W. Gwillimbury, L. Saint & Son, Bradford; No. 208, concrete structures, Innisfil Tp., Curran & Briggs, Toronto, No. 211, culverts, Orillia South Tp., Stewart & Dagle, Orillia; No. 269 culverts, Aldborough Tp., Campbell and Stewart, Ailsa Craig; No. 342, waterbound macadam, Ancaster Tp., westerly, 4 miles, Dufferin Construction Co., Toronto, No. 361, grading, Oro Tp., Stewart & Dagle, Orillia, No. 374, grading Goderich Tp., Thos. Sandy, Goderich, No. 388, grading Lancaster Tp., McLean & Stidwell, Cornwall; No. 302, waterbound macadam, Nelson Tp., Duffering Construction Co. Toronto; No. 414, culverts, Yonge Tp., James Brennan, Arnprior; No. 401, macadam base, Barton Tp., Albion Paving and Contracting Co. Hamilton; No. 402, Macadam base, East and West Flamboro Tps., W. H. Sheridan, Toronto, No. 354, grading, Mona Tp., Castellani Construction Co. Toronto, No. 355, grading Mona Tp., Castellani Construction Co., Toronto, No. 177, culverts, Monaghan North Tp., Hyland Construction Co. Toronto.

Western News

Winnipeg and Vicinity

The contract for the canal excavation on the Lethbridge Northern Irrigation Project was awarded to Grant Smith & Company and McDonnell of Calgary and Ottawa, whose bid was the lowest of five tenderers.

The work involves the removal of approximately 6,000,000 cu. yards of material, and the system covers about fifty miles in all. The contract provides that the work be finished by May 1st, 1923.

The work has been divided in some parts among subcontractors who have commenced operations.

All Western Canada is looking forward to a bumper crop this year. Abundant rain has fallen on all sections, and the prospects are most favorable for a record yield.

A large pulp and paper mill will, in all probability, be established east of Lake Winnipeg. The tender of J. D. McArthur of Winnipeg for a large pulpwood concession in this territory has been accepted by the Dominion Government.

The City Housing Commission of Winnipeg expects to spend $500,000.00 in the erection of 175 new houses during 1921.

The proposal to erect a $150,000 hospital at Dauphin was favorably reported on by the Manitoba Legislature at the last session.

Many contracts have been let for road improvements in three Prairie Provinces, and this Autumn should see a marked improvement in the highways throughout the West.

During the season of 1920, road construction in Manitoba reached its highest point in the history of the Province. In all about 845 miles of road were graded and 230 miles graveled.

The season of 1921, however, bids fair to surpass the record of 1920, as the proposed expenditure by the various municipalities totals nearly three and a half million dollars, though it is doubtful if the whole of the contemplated work will be carried out this season.

Edmonton and Vicinity

Grant Smith & Company and McDonnell Ltd., got the contract for the earth excavation of the Lethbridge Northern Irrigation Project which amounted to about 6,000,000 cubic yards. Their office is in 417 Burns Bldg., Calgary, Alberta. Neaurhen and Mannix of Calgary, subcontracted 1,500,000 yards and D. Monroe of Spokane subcontracted about 2,000,000 yards. About half of the earth work is team and Fresno work and the balance dragline work. Grant Smith and Co. will have one big dragline, Neaurhen and Mannix one dragline and D. Monroe two draglines.

Tenders will be called for immediately to do the flume work and building of the dams. The estimate for this part of the work is $3,500,000.

H. E. Carleton got the contract to build the branch line for the Luscar Collieries. He will use one Model 40 Marion on this work; the balance will be station work.

Tenders have been received calling for building of the Central Canada Railway from Peace River Crossing to the Waterhole District, about twenty-five miles. These bids closed June 11th. A small portion of this construction is steam shovel work and the balance team work.

Engineer A. B. Cooper, Cranesman Geo. Neelands, Fireman H. Moller and Watchman D. McLeod are on a 70-C Bucyrus for the Northern Construction Co. Ltd. on the Alberta Great Waterways Railway, slinging ballast.

R. B. Sullivan is operating a small Bucyrus for the Canada Land and Irrigation Co. Ltd., in Southern Alberta.

Survey parties are out on a preliminary expedition looking into the feasability of opening up an Irrigation Project through Central Alberta, by damming the Saskatchewan River near Rocky Mountain House, and transferring the water from there into the Red Deer River and further on down the Red Deer River putting in another dam using Buffalo Lake as a reservoir. The estimated cost of this project is 50,000,000 Dollars.

Mannix and Neaurhen have sublet 320,000 yards of their dirt work on the Lethbridge Northern Project to Farralley Brothers who will put in a dragline.

Vancouver Notes

Vancouver and District Joint Sewerage Board plans to change the outfall of the sewers now emptying into English Bay. Engineer, A. D. Creer.

Arrangements will be made by the Vancouver and District Joint Sewerage and Drainage Board to immediately secure a loan of $200,000 to enable necessary work to be carried on. Engineer, A. D. Creer.

Board of Works approved program of City Engineer F. L. Fellowes for grading and gravelling of streets. Estimated cost, $170,403.50.

Board of Works approved proposed construction of Clark Drive sewers. Cost, $22,000. City engineer, F. L. Fellowes.

J. P. Forde, Department of Public Works, Canada, recently in charge at Nelson, B. C., has arrived in Victoria to take charge of the Vancouver Island, Skeena and Yukon districts.

E. H. Verner has been appointed acting district engineer for district No. 4, Department of Public Works, British Columbia, with headquarters at New Westminster. He succeeds H. Philipp, who in turn succeeds A. E. Forem who resigned some time ago.

A. F. Mitchell, acting district engineer, Dominion Department of Public Works, Victoria, B. C., has been appointed senior assistant engineer.

Tenders will shortly be called by S. S. Magoffin, contractor, for a warehouse in connection with the ocean dock his firm is now building.

Provincial Department of Public Works let contracts to the Columbia Bitulithic Co. for the construction of 6½ miles of asphaltic concrete pavement at Ladner for $169,000 and 2.03 miles for $46,000.

Central States Notes

There was a letting at Fayetteville, W. Va., on June 6th, for the construction of twelve and one half miles of road between Quinnemont and Stone Cliff, comprising total excavation of 135,000 yds. The work was divided into three sections. N. K. Sneed of Huntington, W. Va. was awarded the contract for one section, and Walton Sudduth Co., Bluefield, W. Va., was awarded the other two sections.

G. G. Waugh is progressing nicely with his work on Elk River, Kanawha County, W. Va. He is using a 14-B Bucyrus and a Type B Erie shovel.

Brown & Floyd are getting along nicely with their Elk River Job. They are using their new 14-B caterpillar machine and their Type O Thew shovel.

Cooper & Piper have recently installed a new Erie Type B caterpillar machine on their Elk River job. They are getting along nicely.

Hunkin-Conkey Construction Co., Cleveland, Ohio, were awarded the contract for the construction of the Baldwin Reservoir in Cleveland.

J. E. Boyd is operating a 70-C shovel for the Salina Gravel Co. at Muskogee, Okla.

Mr. Locher, of Grant Smith & Co. and McDonnell, of Calgary, were visitors in Chicago a short time ago. Mr. Locher was investigating dragline equipment for their recently acquired contract for canal excavation with the Lethbridge Northern Irrigation District, Alberta.

Mr. E. J. Scott of St. Louis was a visitor in Chicago last month.

The C. R. Cummins Co., 1961 Railway Exchange Bldg., St. Louis, Mo., were awarded about 2½ miles of Illinois State Highway work near New Memphis, Ill. They have 45,000 yds. of team work to sublet.

The C. R. Cummins Company of Cleveland, with district offices in St. Louis, have been awarded a 258,000 cubic yard road contract on the Illinois State Highway at New Memphis, Illinois. Their Marion 220 dragline is being shipped to this job.

Iowa

Sealed bids were received at the office of the county auditor Eldora, Hardin county June 7, 1921 for grading, draining, and gravel surfacing on the primary road from Story county line north and east through Hubbard and Iowa Falls to the Franklin county line, for grading and draining on the Hubbard-Iowa Falls road and Eldora-Iowa Falls road and grading, draining and graveling on the Eldora-Grundy Center road all involving 53,501 cu. yd. excavation, 35,686 cu. yd. of gravel surfacing, 243,043 lin. ft. of 6″ tile, 11,547 ft. of 8″ tile, 1,800 ft. of 10″ tile and 48 intakes.

Sealed proposals were received at office of the Secretary, Mississippi River Commission, 1311 International Life Building, St. Louis, Mo., on June 24, 1921, for constructing about 420,000 cubic yards of earth work by the hydraulic method in the Iowa River-Flint Creek Levee District No. 16.

Sealed proposals were received at office of the Secretary, Mississippi River Commission, 1311 International Life Bldg., St. Louis, Mo., on June 24, 1921, for constructing about 350,000 cubic yards of earthwork by the hydraulic method in the Louisa County Levee District No. 15.

Massachusetts

Richard Williams is firing a Keystone Steam Shovel at Indian Orchard.

Missouri

Twenty-one miles of drainage ditches will be constructed and the system of drainage improved in District No. 10, Scott County, one of the oldest drainage districts in the lower Mississippi Valley. The contract has been let to C. R. Cummins, St. Louis, on a unit price basis of 12.5 cents per cubic yard, or $205,000. It will require 16 working months to finish the job. Development and cultivation of the land, which has increased the off-flow through the old system of ditches necessitated enlargements. The maximum channel width of the largest channel will be 53 feet, bottom measure.

This is one of the first large contracts let in the lower Mississippi Valley since financial depression was first felt a year ago and the effect of declining cost of material and labor was clearly shown, not only by the successful bidder but by other bids none of which were above 13.88 cents per cubic yard.

Drainage District No. 10 includes 27,000 acres of bottom or alluvial land in the southeast corner of the state. In 1912, work was done on lateral ditches to aid in taking care of off-flow caused from development of farm lands. The new work is being directed by the Morgan Engineering Company of Memphis, Tenn.

New York District

The Awixa Corporation of Islip, New York have secured a road contract in Nicholson, Pa., consisting of 6½ miles of the Delaware trail. The heavy excavating on this job will be done by a Bucyrus 30-B mounted on

caterpillar. This contract covers part of the proposed Delaware trail extending from New York to Chicago.

H. E. Brooker is erecting a Class-20 Bucyrus Dragline for the Gillespie Contracting Company in Detroit, Mich., on their Coopers Creek contract. Two Class-20 Bucyrus machines will be used.

The Water Department of the city of New Bedford, Mass., has purchased a 14-B Bucyrus Clam Shell machine on caterpillar, to work with the other 14-B Bucyrus shovel which is already on the job. This machine will assist in handling pipe, unloading sand and digging.

Joseph Johnson's Sons will complete their extensive road job at Staten Island in a couple of weeks. This will make a complete concrete road on the sound side of Staten Island from St. George to Tottenville. The road is being built to accommodate the extreme heavy truck traffic from New York City and the southern points.

J. L. Bockmann is nearly finished excavating the grade on his road job at Roselle, New Jersey and will start laying concrete in the near future.

John Heller of South Orange has completed the laying of a new concrete road from Aldeen to Roselle, New Jersey.

Linde & Griffith of Newark, New Jersey are about to start work on a $200,000 bridge across the Elizabeth River at Elizabeth, New Jersey.

The excavating concrete work for the foundation of the New York City Court House has been completed and work on the rest of the construction will soon be under way.

Movement is under way by the New Jersey State Engineering Dept. for a concrete bridge over the Raritan River from Perth Amboy to South Amboy. The old wooden bridge at that point which handles the heavy Jersey coast traffic was condemned some time ago.

Mr. Spellman of the Oliver Company, M. J. Bruce and Arthur McConnville, all New York State road contractors are busy on work near Potsdam, Norwood and Santa Clara, N. Y.

The city of Buffalo will probably vote this Fall on the question of issuing bonds to cover the cost of installing a large filtration plant for the city water.

Work has started in Buffalo on the new Statler Hotel. Part of the site was formerly the old home of President Fillemore. 8000 tons of steel are needed in the erection. Fort Pitt Bridge Works has the contract for the steel. The new hotel will front on Niagara Square and face the McKinley monument.

Northern States News

Most of the large highway contractors in this vicinity have gotten well under way with their road jobs which have been awarded to them during the past few months and will undoubtedly complete their various projects on schedule. This fact should be very gratifying to the various counties where good roads are so badly needed. It is claimed in a few instances contractors have incorporated completion dates in their bids simply as an incentive to be awarded contract without any thought of living up to their completion date promise. If this claim was correct legislation should be passed prohibiting this practice. It is not fair to a contractor who figures his job on the basis of using sufficient forces and equipment to allow him to complete same as promised to have to compete with a bidder who simply puts in an earlier completion date based on inadequate equipment to allow him to fulfill his promises in this respect.

A. Guthrie & Co. are hitting the ball hard on their large Itasca County highway job and will undoubtedly anticipate completion date called for in their contract.

Fogelsonger & Madison, St. Ignace, Michigan, have been awarded contract for improving 12.465 miles of road in Mackinac County.

Sam Mathiason, Brandon, Minn., has been awarded three miles of road work in Douglas County, Minnesota.

Jacob Herr, Jr., Ashley, North Dakota, was the successful bidder on F. A. P. 97 in McIntosh County, N. D.

Louis G. Harmon, Cornell, Mich., was low bidder on 17.9 miles of road in Delta County, Mich.

M. J. McCarthy Co., St. Paul, Minn., were successful bidders on F. A. P. 95 in Chisago County, Minnesota.

Anderson & Lindquist of Chatham, Michigan, and Underhill & Co. of Munising, Michigan, are successful bidders on two respective sections of 4.951 miles of road work in Alger County, Michigan.

Mr. K. C. Rchardson of Anoka, Minnesota, received award for 185,000 cu. yds. of walking dredge work in Stearns County, Minn.

The following work has been awarded by St. Louis County, Minn., bids for which were called for on May 31st. F. A. P. 181, A. Guthrie & Co., St. Paul, Minn., State Job No. 2104, 9.09 miles of grading, A. Guthrie & Co.; State Job No. 2109, 15 miles grading, A. Guthrie & Co., St. Paul, Minn.; State Job No. 2108 Plan A, 11 miles of grading, Edw. Johnson, Superior, Wisconsin; F. A. P. No. 190, 8000 lt. grading, A. Guthrie & Co., St. Paul, Minn. State Project No. 2001, E. F. Remer, Hibbing, Minn.

Contract for surfacing seven miles of Miller Trunk Road, involving 87,633 sq. yds. of concrete has been awarded to Aaby & Maturi. This road extends from Eveleth to St. Louis River.

Notes from the Pacific Coast

BY L. T. RUSSELL AND C. W. WHITNEY

Work being carried on in District 833 in California is about the most active in the Sacramento Valley at the present time. This District comprises 40,000 acres located west of Gridley and Biggs. The work consists of digging drainage canals of various sizes. The George Pollock Company has in operation a Class-14 Bucyrus Dragline, a Marion 36, 1½-yard dragline, a Monighan 2-yard dragline and a 1¼-yard floating clamshell dredge. Their ditches run from 20 to 50' wide at the bottom up to 8' deep, the total yardage approximating about 1,000,000 yards. Other contractors on the District are Dan Bayliss with a ½-yard Austin and a Bay City machine; Haas & Doughty with a Bay City machine; John Phillips with a ½-yard P. & H. dragline, and a rebuilt Keystone machine. There are also three other Keystone machines on the District. The smaller ditch work is contracted at 30 cents a yard and the larger ditches at 34 cents.

Recent California State Highway contracts were let to Nevada Contracting Company, Mono County, 13 miles; W. J. Schmidt, Amador County, 11 miles; A. J. Fairbanks, Humboldt County, 10 miles; Palmer & McBryde, Mariposa County, 8 miles.

Palmer & McBride have been awarded the contract for the construction of the athletic field and Stadium at Standard University, California, they being the lowest bidders. Amount of the contract was approximately $170,000. The Stadium when completed will have a seating capacity of 60,000 people.

Considerable interest is now being taken in the Boulder Canyon project on the Colorado River. This is one of the largest developments that has been projected in the United States, and a controversy is developing between the Southern California Edison Co. of Los Angeles which is filing applications for developing electric power in connection with this dam. The State and Government interests who have the preliminary development of the project well in hand will undoubtedly control it. The Edison Company's application states that the project is capable of developing two and one-half million horse power and that power will be distributed in Arizona, New Mexico, Utah, Nevada, California and parts of Colorado, Texas and Wyoming. It is estimated that the total expenditure will be about $800,000,000. or twice the sum spent on the Panama Canal. Among the projects they state this enterprise will take care of are the following: Production of 4,350,000 horse power which is stated to be equal to one-half of the present total production in the United States. Absolute flood control for

all Colorado river lands and areas. Irrigation of 2,250,000 acres in addition to the lands already under ditch formation of a storage basin 200 miles long. Impounding 40,000,000 acre ft. of water rendering 300 miles of river navigable.

Boss & Hampshire succeeded so well in snow shoveling on the Sunset Pass Highway that they received a similar job in the Rainier National Park.

This firm of contractors have just opened offices in the Pittock Block, Portland, Oregon.

A. D. Kern has quite a lot of highway work under way, both paving and grading, the greater part of the grading work being handled by station men.

We are advised that K. L. Goulter & Company of Ilwaco, Washington, was recently awarded two contracts in eastern Washington, and we hope they have the same good success on this year's work as fell to their lot for last year.

We have seen a number of our friends among the shovel runners lately. Their worthy secretary, Mr. Wills, reports conditions somewhat quiet.

The lumber industry throughout the northwest does not liven up as it should, in the opinion of many people directly concerned, but we hope the next two or three weeks sees a considerable change for the better.

There is a very considerable amount of road work on which bids were opened June 25th, and many contractors offer bids.

The writer spent a few days recently at Klamath Falls, Oregon, and appreciated very much the hospitality extended by Mr. H. D. Newell, Project Manager of the U. S. Reclamation Service, and his capable Assistant Engineer, Mr. Willard L. Smith.

Contracts recently awarded in Oregon were:

Gillium county, Condon-North section, John Day highway, six miles grading; A. D. Kern, $57,130.60.

Jackson county, Agate-Trail section of Crater Lake highway, 14.35 miles broken stone surfacing; William Von der Hellen; $98,250.

Union and Wallowa counties—Wallowa hill section of the LaGrande-Joseph highway, 5.48 miles grading A. D. Kern, $101,744.

Lane County, Thurston-Walterville section of McKenzie highway, 4.56 miles grading and macadam, Lane county court, $34,981.

On June 13th contracts for grading the road known as the Mt. Hood Loop were let. This section amounts to approximately 25 miles, of which Howitt & Dixon received contract for one section of about 11 miles, and the E. A. Johnson Construction Co. were awarded the balance.

Rajotte, Winters & Company have practically completed their road work near Skamania, Washington, and have consolidated their outfit from Skamania with the one at Underwood, Washington, where they have several months work with a Marion 60.

Pennsylvania

Pittsburgh and Vicinity

F. A. RUMBARGER

Mr. Holmes of the Kehota Coal Company was a business visitor in Pittsburgh a few days last month.

George McGilvery is running the Narva Coal Company's 225-B Bucyrus at Cadiz, Ohio.

George Fromm is running their Marion 36.

Joe. Walton is running the Blanchard Coal Company's 225-B Bucyrus at Wyano.

Wm. McLean, President, B. H. Cannon, Gen. Manager of the Clinton Block Coal Company, attended the National Coal Operators Convention held in New York.

Steam Shovel and Dredgemen voted June 12th on a rate reduction and unanimously voted for a 10 per cent reduction with working conditions as before, i e. eight hours a day one and one-half time for overtime, double time for digging and moving machines on Sundays and Holidays. With this reduction the present price would be:

Engineers	$225.00
Cranemen	180.00
Firemen	144.00
Oilers	144.00

It is reported that several of the Contractors and Coal Strippers have accepted this scale.

Southern States News

BY C. N. BALLENTINE AND E. J. WILKIE, BIRMINGHAM, ALA.

E. D. Israel is looking for a position as engineer on standard or revolving shovels. He can be reached c/o General Delivery, Lovick, Alabama.

J. T. Moses, the steam shovel engineer, is now at his home 226-7th Street, Bessemer, Alabama.

Geo. W. Turner has his Bucyrus 14-B caterpillar shovel working on the contract for the basement of the new Market House at Memphis, Tenn.

E. P. (Pete) Needham is operating the Bucyrus 14-B shovel on Mr. Turner's work in Memphis. The total excavation for the basement of the new Market House amounts to about 35,000 yards.

From figures recently published it appears that the coal production in Alabama is running a little less than 60 per cent of normal. Some contracts with railroads were secured by operators in this section which call for a large supply of coal.

Hunt County Drainage Dist. No. 1 was organized recently in Greenville, Texas. The work in view provides for the reclamation of about 3000 acres. Mr. Arthur A. Stiles, State Reclamation Engineer, Austin, Tex., is the engineer for this work.

There will be a million yards of work done in the Alcovy River Drainage Dist. No. 2. Mr. Will D. Alexander, Charlotte, N. C., is the engineer in charge.

The New River Drainage Dist., Newman, Ga., will let in the near future about 300,000 yards of work in connection with the channels in New River and Mecier Creek.

Additional reclamation work is being contemplated by Dallas County Levee District No. 3, Dallas, Texas.

The Murray Construction Company of Knoxville, Tenn. recently purchased a 1½-yard dipper dredge which they will use for digging sand and gravel out of the Tennessee River at that place. This company operates one of the most up-to-date sand and gravel plants in the south.

Messrs. Dunn and Woodall, Contractors, Atlanta, Georgia, recently secured a contract for constructing about 10 miles of Federal Aid Highway near Camden, Tennessee. The contract price was $87,821.34. They will use an Erie shovel on this work.

J. S. Romell and Frank Romell are operating a 35-B Bucyrus shovel for the Arkansas Brick and Tile Company, near Little Rock, Arkansas.

Brooks Callaway Company of Atlanta, have been awarded a contract for constructing about 8 miles of road near Dillon, South Carolina.

J. R. Lamb is operating a Bucyrus Class-9½ Electric Dragline for the Cherokee Brick Company, at Macon, Georgia.

The phosphate mines in Florida continue to be closed down on account of lack of market for their product. A good many of the companies are optimistic as to business improving toward fall. Recently a combination was formed among a few of the larger companies which has for its purpose the financing of foreign business and it is hoped that the export business will improve on account of this.

Many drainage projects in Florida are being delayed on account of the lack of a market for the bond issues. It is hoped that conditions will soon improve in order that the work may go on.

Texas

Becknal Brothers, of Terrell have, it is reported, been awarded contract by the Texas Midland Railroad to build

its proposed extension from Greenville to Commerce, 14 mi. Estimated cost about $500,000. E. H. R. Green, Terrell, is President.

Cisco & Northeastern Railway Co., it is reported, is surveying for an extension from Breckenridge to Crystal Falls and thence to Seymour via other points in oil and coal regions. R. Q. Lee, Cisco, is President.

Foreign

Mexico

Surveys for the proposed dam on the Rio Verde and the extensive system of irrigation that is to be constructed in the valley of that stream by the Corporacion de Agriculture e Industria de Mexico have been finished. The material for the concrete work of the dam has been ordered and construction work will begin soon. This dam and irrigation project is known as the largest in Mexico. In addition to bringing about the reclamation of a vast area of rich land, the storage reservoir will afford power for generating more than 100,000 horsepower of electrical energy for transmission to San Luis Potosi and other cities and industrial centers within a radius of 150 miles, it is stated.

Alaska

More than $700,000 wll be spent on road work here this year, according to Capt. C. S. Ward of the Alaskan Road Commission.

The main road between Valdez and Fairbanks, which has been closed for two years will be opened this summer. The commission will also open roads into Kantishna mining district, which will also make the Mt. McKinley National Park more accessible as the road will cut through a corner of the park. The Commission is planning to complete the road between Takotna and Ophir in KuskoKwirn River district this season. This road is 30 miles in length and was started two years ago. They are also planning to complete Chatanika-Circle road, which will give a through road from Valdez to Circle through the Fairbanks district.

PROSPECTIVE CONSTRUCTION

Alabama

The State Highway Department will submit to the Board of Public Roads, the following projects: 12 miles of Highway in Limestone County, leading from Athens toward Florence, estimated cost $300,000. The Highway Department will soon advertise for bids for 23 miles of road work on the Bankhead Highway in Talladega County, also for work on 14 miles of road in Mobile County, and 2½ miles of road and two bridges in Washington County.

Canada

Alberta

Luscar Colleries Limited has been authorized by the Alberta legislature to build about seven miles of railway from the Canadian National Rys. in the Mountain Forest Reserve to the Mountain Park Coal Company's railway near Leyland. The colliery is owned by a Scotch company.

A new railway to tap the Mackenzie river oil fields is planned by twelve Edmonton business men, including R. G. Brett, lieutenant-governor of Alberta, who have applied for a charter to the Dominion Parliament. The Edmonton & Mackenzie River Ry., the name of the new line, will have its southern terminus at Fort McMurray, on the Athabasca river, where the Alberta & Great Waterways Ry. from Edmonton now ends. It will run to the mouth of Hay river, on Great Slave lake, crossing Peace river near its junction with Jackfish river. It will be 400 miles long. The new railway will connect at the mouth of Hay river with a line of Mackenzie river steamboats.

British Columbia

The Fernie & Elk River Ry. has been incorporated by the British Columbia legislature to build a railway from Sparwood, in the Crowsnest area, along the Elk River valley to the British Columbia-Alberta boundary Kananaskis Pass. This projected line corresponds with the British Columbia section of the line proposed to be built by the Calgary & Fernie Ry., which is applying to the dominion parliament for an extension of time for construction. It was stated when the bill was before the legislature of British Columbia that the line as projected by the company would run into Alberta.

Construction is expected to be started this summer on a line from Okanagan Falls, to the British Columbia demonstration farm below Fairview, a distance of 16.5 miles.

Ontario

The directors of the newly incorporated Northern Light Ry. Co. have drafted an outline for the proposed construction of narrow gauge light railways to the outlying mining districts of Northern Ontario and have presented it to Premier Drury. Plans call for approximately 100 miles of railway of 36-in. gauge, 56-lb. rails, and 8-ton oil-burning locomotives.

Florida

R. L. Summer, St. Petersburgh, plans expending $50,000 for Royal Palms cemetery; construction roads, etc.

Kentucky

State Highway Commission Frankfort, will let contract for highway from Louisville to Paducah; $450,000.

Louisiana

Harry K. Johnson, of New Orleans, it is reported, is contemplating the construction of an interurban railway to Shell Beach in the St. Bernard district.

Michigan

State Highway Dept., Lansing, plans to grade, drain and surface, 4 mi. State Trunk Line Rd. 21-16, and 1 mi. State Trunk Line Rd. 65-1, Sect. A, concrete or bituminous concrete, Genesee Co., 5 mi. State Trunk Line Rd. 19-10, Sanilac Co., 2 mi. State Trunk Line Rd. 22-7, Leeland Co., 5½ mi. State Trunk Line Rd. 76-4, Sect. A, Roscommon Co. and 3 mi. State Trunk Line Rd. 76-9 Sect. A, Ogemaw Co., gravel. F. F. Rodgers, state highway comr.

Minnesota

C. E. Boughton, attorney for State Drainage Bd. at Red Lake Falls, opens bids about July 15, for straightening of Clearwater River. About $100,000. G. Walker, Thief River Falls, engr.

Missouri

State Highway Dept., Jefferson City, plans to build 4.88 mi. state road from Marshfield, northward, State Aid Project S 20.60, Webster Co., involving 22,000 cu.yd.

earth and 224 cu.yd. rock excav., 2,862 cu.yd. borrow and 245.6 cu.yd. Class B concrete masonry, etc., cost $23,000; 2.38 mi. state road from Archie, northwestward, State Aid Project S 20.62, Cass Co., 4,910 cu.yd. earth excav., 16,217 cu.yd. borrow, 42.4 cu.yd. Class B and 31.2 cu.yd. Class C concrete masonry, etc., $16,297; 1.71 mi. state road from Maryville, northward, State Aid Project S 20.33, Nodaway Co., 18,938 cu.yd. earth excav., 1,030 cu.yd. borrow, 121.3 cu.yd. Class B and 7.2 cu.yd. Class C concrete masonry, etc., $20,000; 0.624 mi. state road from Edinburg, eastward, State Aid Project S 20.53, Grundy Co., 17,551 cu.yd. earth and 1,000 cu.yd. rock excav., 44.7 cu.yd. Class B and 29.4 cu.yd. Class C concrete masonry, etc., $21,809; 2.24 mi. state road from Cameron, westward, State Aid Project S 20.56, Clinton Co., 18,734 cu.yd. earth and 10 cu.yd. rock excav., 157.4 cu.yd. Class B and 32 cu.yd. Class C concrete masonry, etc., $20,000; 3.64 mi. state road from Marshall, eastward, State Aid Project S 20.63, Saline Co., 22,186 cu.yd. earth excav., 785 cu. yd. borrow, 1297 cu. yd. Class B and 8.2 cu. yd. Class C concrete masonry, $20,908; 2.74 mi. state road from Morrellton, westward, State Aid Project S 20.40, Franklin Co., 19.881 cu.yd. earth and 10 cu.yd. rock excav., 620 cu. yd. borrow, 65.6 cu. yds. Class B and 92.7 cu. yd. Class C concrete masonry, etc., $17.235.

State Highway Dept., Jefferson City, plans to build 7.75 mi. Gallatin-Trenton State Rd., Federal Aid Project 177, Grundy Co. involving 67,000 cu.yd. earth excav., etc. About $82,921.

North Carolina

State Highway Comn., Raleigh, plans to clear and grub, grade, drain, bridge and surface 12 mi. road from east end of Federal Aid Project 89 at Webb's Mill Bridge, via Spring Hope to Nashville, 18 ft. wide, Nash Co., about $80,000; 10 mi. road from Perquimans Co. line near Okisko, via Elizabeth City to Camden Co. line, near Camden, 18 ft. wide, Pasquotank Co., about $300,000. W. S. Fallis, Raleigh, state highway engr.

State Highway Comn., Raleigh, plans to clear, grub, grade, drain, surface and build bridges and culverts, on 10 mi. road from Whiteville to Waccamaw, 18 ft. wide, Columbus Co. About $50,000. W. S. Fallis, state highway engr.

Ohio

The Pittsburgh Ohio Valley & Cincinnati R. R. has asked the Interstate Commerce Commission for authority to construct and operate an extension of its road, which will run from its present terminus near Powhatan station, Belmont county, in a southerly direction 2.9 miles to a point in the coal lands of the Marcoll Coal Co., in Switzerland township, Monroe county.

City of Canton plans to dredge and straighten channel of middle branch of East Creek, also build concrete retaining wall on west side of creek. About $260,000. W. E. Sarver, City Hall, engr.

Texas

Ch. Engr., U. S. Bureau Public Roads, Washington, D. C., approved plans for construction of Federal Aid Project No. 121 involving construction of 7.4 mi. gravel surfaced road on State Highway No. 11, Grayson County; $104,900; D. B. Steed, County Judge; Sherman; Julian C. Field Engineering Co. Engr., Denison.

Houston Electric Co. contemplates extensions and betterments to cost approximately $3,000,000. Plans depend on agreement with the municipality which will assure financing. Luke C. Bradley is Mgr.

J. B. Nelson Quarry Co., of Houston, bought Steward Bros. quarries and will build 7 mi. spur track to connect with Houston & Texas Central Railroad.

U. S. Bureau Public Roads, Washington, D. C., approved project statement for proposed F. A. Project No. 242 involving 31.2 mi. Highway No . 1 in Reeves County; $272,168.90; J. F. Ross, County Judge; Herbert Schroeter, County Engr.

Utah

Cache County farmers are planning an expenditure of more than half a million dollars on five drainage districts, according to R. A. Hart, engineer of the Federal Drainage Investigation Bureau.

West Virginia

The Pittsburgh & West Virginia contemplates the construction of a branch line, 3½ miles in length, running north from Virginia Station. The grading on this line will be done under contract.

Comrs. Cabell Co., Huntington, plan to grade, drain and pave 1½ mi. 16th St. Rd., 24 ft. wide. About $30,000. J. N. Doyle, Huntington, engr.

Wisconsin

In an address before the Portland Cement Association in Chicago on May 18, 1921, Mr. A. R. Hirst, State Highway Engineer of Wisconsin, outlined the highway program of this state. The state expects to grade about 2,200 miles, which will mean moving about 8,000,000 cubic yards of earth.

Mr. Hirst also said: "We will build 280 miles of concrete roads. This will involve the use of 980,000 barrels of cement or 4,300 average carloads, and 1,344,000 tons of sand, gravel and stone. Besides this little enterprise, we are building 1,000 miles of gravel road involving the preparation and hauling of 1,500,000 cubic yards of prepared gravel. In addition to the construction work, we are maintaining 7,500 miles of the state highway system at a cost of about $2,000,000, employing 900 patrolmen; and our counties are maintaining 5,000 miles of road, employing 600 additional patrolmen. In all, there will be engaged in this work in Wisconsin approximately 25,000 men.

Foreign

Mexico

The Mexican Government is planning to improve highways between principal cities so as to make them suitable to motor vehicular traffic. The Department of Communications and Public Works has announced that Mexico City is to be made the center of an extensive system of roads that will radiate to cities 50 to 300 mi. distant. The old highway between Mexico City and Toluca is again open to traffic. Reconstruction of the highway between Mexico City and Vera Cruz is now in progress. A short time ago the road between the capital and Pachuca was finished.

Philippine Islands

The 30 provincial highway projects, which are part of the program of the insular government for 1921, will double the length of first-class highways in the islands, bringing the total to more than 8000 kilometers, distributed in provincial and interprovincial systems throughout many provinces. Many provincial automobile and motor truck lines have long been in operation and new lines are being added. Some of the companies are well capitalized and operate in various parts of the islands through a general corporation, with reasonable freight and passenger charges.

Not in the Swim

Betty: "I wish you'd tell Billy and Anna to stop playing with those Ainsworth children. Their social standing is growing a bit questionable."

"Why, is that right?"

"Yes, it leaked out at a director's meeting last night that they have the poorest cellar in town." —*Life.*

"The ancients thought the world was flat."

"Well, no wonder. They had no cabarets, no bridge, no cigarettes, no show girls, no moving pictures, no Kaiser Bill. It must have been, in those days."

—*Boston Transcript.*

TRADE NOTES

Carl G. Roebling

Carl G. Roebling, president of John A. Roebling's Sons Company died on Sunday, the twenty-ninth of May, 1921.

List of Price Reductions of Hercules Explosives and Blasting Supplies. (Effective June 1, 1921.)

Effective June 1, prices on Hercules High Explosives in carloads and less than carloads, and Hercules Black Blasting Powder in carloads and less than carloads, were reduced as follows:

	per 100 lbs.
Hercules 40% Extra Dynamite	$1.25
Hercules 40% Gelatin	1.75
Hercules 40% Nitroglycerin Dynamite	1.25
Hercules Red H. Permissible Explosives	.50
Hercules R. R. P.	1.25
Hercules Xpdite Permissibles Nos. 1 and 2	1.50
Hercules Xpdite Permissibles Nos. 3 and 6	.75
Hercules Black Blasting Powder	$.10 per 25 lb. Keg

Hercules Blasting Caps and Electric Blasting Caps were reduced in price, effective June 1, as follows:

No. 6 Blasting Caps.....$2.50 per thousand
No. 6 Electric Blasting Caps (4 ft. wires) $1.00 per hundred

(Proportionate reduction on longer lengths and other electric blasting accessories.)

In addition to reducing prices the Hercules Company have developed formulae—the result of exhaustive studies and experiments—which have enabled them to discontinue the manufacture of high freezing dynamites without sacrificing any desirable feature which those grades possessed. This means that Hercules Extra and Gelatin dynamites, Hercules Special No. 1 and Hercomite, and most of their Straight Nitroglycerin dynamites and Red H Permissible Explosives can now be used without thawing under all temperature conditions that are encountered in practically any blasting work.

Rumors of the proposed purchase of the Aetna Explosives Company, Inc., by the Hercules Powder Company received definite confirmation June 6 when the Aetna stockholders sanctioned the sale of its properties, assets, and business. This marks the culmination of a transaction that has interested financial and business circles for the past two years, and which in addition to being a deal of considerable moment also presents an unusual legal aspect. The last formality took place on this date with the actual transfer of the property.

Although it has been understood practically since the close of the war that negotiations were under way between these two manufacturers, it was not until the petition of the Hercules Company for permission to purchase the Aetna Company had been acted on favorably by the Circuit Court of Appeals, sitting as the United States Court for the District of Delaware, that the proposition assumed any real definiteness. The Hercules Company was originally created by a decree of a Federal Court in an action brought by the United States against the DuPont Company under the Sherman Act. Although not a party to this action, the Hercules Company is bound by certain injunctions in the final decree, and for this reason it was deemed necessary to petition the court for permission to effect the present transaction.

By this purchase the Hercules Company will acquire high explosives, or dynamite, plants near Birmingham, Ala., Emporium, Pa., Sinnamahoning, Pa., Ishpeming, Mich., and Fayville, Ill., two black blasting powder plants, one at Goes Station, Ohio, and the other near Birmingham, Ala., a plant for the manufacture of blasting caps and electric blasting caps at Port Ewen, N. Y., and a plant for the manufacture of fulminate of mercury, for use in blasting caps, at Prescott, Ontario, Canada.

The explosives industry differs from most others in that it is limited geographically in making sales because of freight rates. It is only possible to ship such commodities a limited distance from the place of manufacture before a point is reached at which transportation costs make it impossible to compete with other companies having plants nearer the particular consuming center. The principal significance of this transaction to the Hercules Company is that it will in the future, because of the location of the Aetna plants, be able to enter territories in which it has previously found it unprofitable to sell. It will thereby compete all the more successfully with other explosives manufacturers.

Gilbert E. Ryder has been elected Vice President of the Locomotive Superheater Company in charge of sales with office in New York. He was born in Minneapolis, Minn., in 1880. He studied engineering at the University of Wisconsin and also at the University of Illinois. His railroad experience began with apprenticeship on the Chicago, Milwaukee & Saint Paul Railway and included service as a journeyman in the mechanical department of that road at Dubuque, Iowa, Ottumwa, Iowa and West Milwaukee, covering five years. Engineering experience followed in the fuel testing bureau of the Technologic Branch of the United States Geological Survey. He later served the City of Chicago as deputy Smoke Inspector in charge of Locomotives which placed him again in intimate contact with the locomotive fuel conservation problem. This was followed by Editorship of the Railway Review of Chicago after which he entered the service of the Locomotive Superheater Company 10 years ago. He became a member of the service department and later took charge of that department which today is responsible for the operation of 30,000 Superheaters on locomotives in this country alone in addition to stationary and marine applications. He also developed and had charge of the publicity department. Mr. Ryder takes responsibility of the sales of this Company, (railroad, stationary, and marine) with an unusual preparation in wide and very valuable engineering and practical experience.

Henry B. Oatley has been elected Vice President in charge of Engineering of the Superheater Company with offices at New York. Mr. Oatley was born at Rochester, New York and attended the public schools at that place. He received his engineering education at the University of Rochester and the University of Vermont graduating from the latter in 1900 with the degree of Mechanical Engineer. Upon graduation he entered the service of the Schenectady Locomotive Works. His experience while on this work was very broad embracing locomotive design and shop testing. He was associated with M. F. W. Cole, in the early development of the superheater for locomotives by that company.

In 1910 upon the formation of the Locomotive Superheater Company he accepted the position of Mechanical Engineer and in 1916 was appointed Chief Engineer for this company, which position he held at the time of his election above noted. In April 1917 he was granted a leave of absence and served as an officer in the U. S. Navy on the battleships Ohio and Indiana. He entered service with the First N. Y. Naval Militia which was the first body of armed troops to move after the declaration of war with Germany.

Mr. Oatley is a recognized authority on superheating and has been an active factor in its development. He is in a large measure responsible for putting Superheater design upon a practical operating and manufacturing basis in locomotive, marine and stationary practice and, without sacrifice of efficiency, has developed uniformity of sizes and design.

Mr. Charles H. True, has been elected Vice President of the Locomotive Superheater Company, in charge of production with offices at East Chicago, Indiana. Mr. True was born in Boston, Mass. He was educated at the Public Schools of Schuyler, Nebraska, and the University of Nebraska, graduating in 1898, with the degree of Electrical Engineer. Immediately upon graduation he entered the service of the Union Pacific Railway, at Omaha, and served in both the Locomotive and Car Shops. In 1902 he became Round House Foreman at Grand Island, Nebraska, and in 1903 resigned from the Union Pacific to take a similar position at Trenton, Missouri, with the Chicago Rock Island & Pacific Railway. In October of the same year he was transferred to the Silvis Shops, as Assistant Superintendent of Shops. In 1905 he accepted the position of Mechanical Engineer with the Railway Materials Company, at Chicago, and was engaged in the design of Metallurgical Furnaces for blacksmith shops and boiler shops. In 1910 he refitted and took charge of the Phoenixville, Pa., Plant of this Company. In 1912 he resigned his position with the Railway Materials Company to become Works Manager of the Locomotive Superheater Company at East Chicago, Indiana, which position he held at the time of his recent election to the Vice Presidency as above noted.

During the time he was Works Manager he was actively associated in the Mechanical Development of Superheaters for Locomotive, Marine, and Stationary Boilers. Mr. True is a member of the American Society of Mechanical Engineers and other engineering societies.

Know Explosives Before You Use Them

Explosives are being advertised and used extensively for many purposes, among which are: clearing the land of stumps and boulders, digging ditches, loosening baked or frozen ground, mining and quarrying. While the former is directly concerned with only a few of these purposes, particularly where the improvement and the development of his soil is concerned, and the miner and quarryman also have their interest in explosives, confined to the limited field in which they work, the road contractor and engineer must acquaint himself with practically all the uses and purposes of explosives. He must play the part of the farmer in removing objectionable stumps and boulders, in draining and preparing the soil for his roadbed. He must, at times, "quarry" a side of a hill and "mine" a tunnel in constructing a right of way. He will need to use every kind and grade of explosive for his many and varying purposes. For this reason it is logical to advise and urge that the road builder should study and become thoroughly acquainted with every use of explosives, as explained in the handbook furnished upon request by the leading manufacturers of these materials.

And when the time comes for him to remove stumps, or break boulders, or dig ditches for drainage, or loosen soil, or open tunnels, or slice hills, or raze buildings—or whatever he may need to do—he will realize that he has at hand a quick, safe, efficient and economical means of accomplishing this by employing the right kind of explosives in the proper way.—*Exchange.*

Not So Sure

An elderly man was persuaded by one of his sons to go with him to a football game.

The son, intent upon giving his father a good time, had bought two seats in the grand stand.

"Now," said the son joyfully, "you'll see more excitement for your $2 than you've ever seen before."

The old man grunted.

"I don't know so much about that," he said, dismally. "Two dollars was all I paid for my marriage license!"

—*Houston Post.*

Susie: "Papa, what makes a man always give a woman a diamond engagement ring?"

Her Father: "The woman."

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the price named.

DIPPER DREDGES FOR RIVER, HARBOR AND CANAL EXCAVATION—16 page bulletin 8½" x 11", describing dipper dredges of all sizes for various kinds of work. Profusely illustrated with photographs showing dipper dredges in operation all over the world. Detailed description of dipper dredge machinery, with many illustrations. This Company is prepared to design and build dipper dredges to meet any and all reasonable requirements. *Bucyrus Company, South Milwaukee, Wisconsin.*

BUCYRUS WIRE ROPE AND WIRE ROPE FITTINGS—8-page bulletin, 8½" x 11". In addition to describing wire rope and fittings, this bulletin contains a great deal of useful information regarding the care, installation, lubrication and inspection of wire rope, which will be of value to all users of wire rope. *Bucyrus Company, Specialty Department, South Milwaukee, Wis.*

EXCAVATING:—A complete catalog describing and picturing all details of the Smith Excavator and Loader has just been published by the T. L. Smith Co., Milwaukee, manufacturers of the well-known line of Smith Concrete Mixers and Pavers.

One half of the catalog is devoted to mechanical features of the machine. The other half of the catalog shows the machine in action under a wide variety of conditions—digging and loading soil, gravel and sand, plowing in frozen earth, excavating for basements, excavating beneath a completed building, on county road work, etc. A number of interesting letters are quoted from users who have reported big production with this machine and two men.

A copy of this catalog may be obtained by writing to the *T. L. Smith Company, Milwaukee, Wis., asking for Bulletin 408.*

ENGINEERS' AND SURVEYORS' FIELD AND OFFICE SUPPLIES: Engineers and surveyors will be interested in a 40-page catalog of field and office supplies just issued by the C. F. Pease Co., of Chicago. This book lists drawing, profile, and cross-section papers, tracing cloths, blueprint papers and blueprinting machines, drafting room furniture, and such field supplies as transits, levels, ranging poles, leveling rods, etc. Prices and descriptions of each article are given and the book is very fully illustrated. A copy of this new catalog may be obtained by addressing *The C. F. Pease Co., 841 N. Franklin St., Chicago, Ill.*

7 AND 12-TON CRAWLING TREAD AND ROAD WHEEL LOCOMOTIVE CRANES—A 12-page, 6" x 9" catalog, describing the two small sized cranes manufactured by Orton & Steinbrenner Company. The catalog is profusely illustrated showing the application of the two machines, and containing description of parts. These two smaller sizes of cranes have been adapted for operation on ground. The use of locomotive cranes travelling on rails has been so varied that it is easily seen how greatly the field of the cranes traveling on ordinary ground is increased. *Orton and Steinbrenner Company, 608 South Dearborn Street, Chicago, Illinois.*

Old Friends

Bobby's mother took him out to the park the other day, and as they stood watching the birds in their enormous cage the little fellow observed a stork gazing at him. "Oh, look mother," said Bobby. "The stork is trying to see if he remembers me still."

Nature was kind when she so constructed man that he cannot kick himself. —*Book of Smiles.*

Two Views

Temperance Advocate—"Stay, brother, do you think that glass of vile filth will quench your thirst?"

Optimist—"Lumme, I 'ope not."

Reporting to Davy Jones

Sam, on board the transport, had just been issued his first pair of hobnails.

"One thing shuah," he ruminated, "if Ah falls overboard, Ah suttinly will go down at 'tenshun."

Willie: "Pop, what are 'ancestors'?"

Father: "Well, I'm one of yours, your gran'dad is another."

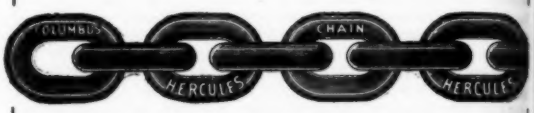
Willie: "Oh, I see. But why is it that folks brag about them?" —*New York Globe.*

FOR SALE

One 5-ton Holt caterpillar tractor. One 10-ton Holt caterpillar tractor. Used only short time. Guarantee first-class condition. One Nash Quad truck with "Hesse" two-wheel trailer and power winch, 7-ton capacity. Good condition. For further information and price address

Kentucky Lumber Company
Sulligent, Alabama

HOISTING CHAINS FOR STEAM SHOVELS



"HERCULES SOLID WELD" STEAM SHOVEL CHAINS

Highest Grade Manufactured

Always in stock Wire your order.

THE COLUMBUS McKINNON CHAIN CO.
General Offices
COLUMBUS, - OHIO

ROEBLING WIRE ROPE

The Wire Rope of Quality

JOHN A. ROEBLING'S SONS CO., Trenton, N. J.
165 West Lake Avenue, Chicago, Illinois

For convenience in making inquiry use postal inserted in this number.

High Record on Levee Enlargement

A letter from G. A. Langhofer, U. S. Superintendent, Third District, Mississippi River Commission at Gunnison, Mississippi advises that the 5-yd. Bucyrus tower excavator which has been in operation in that District enlarging the levees has made an exceptionally good record for the season.

This machine excavated 700,000 cubic yards for the season and during the month of March excavated 73,000 cubic yards in 20 working days of 10-hour shifts.

On March 23 this machine in nine hours and 58 minutes moved 4,200.75 cubic yards on a 500 ft. haul. This machine is operated by J. G. Davis. J. T. Perry and W. F. Kellogg are running a Class-9½ Bucyrus dragline which has been working ahead of this tower excavator taking off the top of the levee and preparing the way for the big machine.

Your Neighbors and Mine

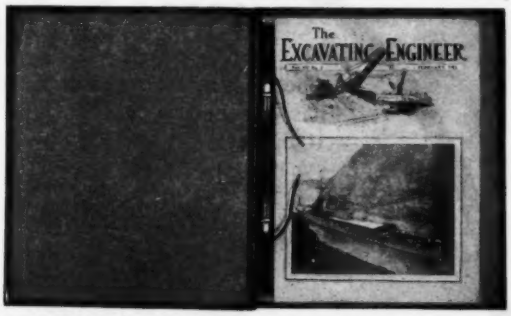
She paused at the bold-face slogan in the Chicago Tribune—"1921 Will Reward Fighters."

"If that's true," she remarked, "the couple next door will be multi-millionaires." —*Indianapolis Adscript.*

SIX MONTHS FROM NOW

You May Need Some of the Information Given in this Magazine

THIS BINDER



Will Keep It Where You Can Find It

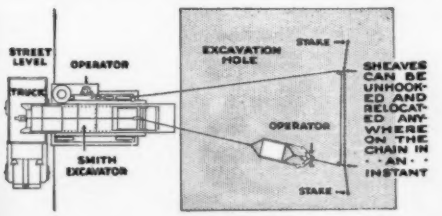
Price, $1.50

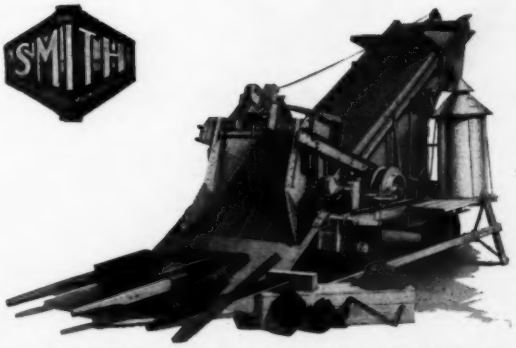
THE EXCAVATING ENGINEER

South Milwaukee, Wis.

2 Men and Smith Excavator Do Work of 20 Men

YOUR money-making possibilities with a Smith Excavator and Loader are enormous. B. A. Giese, a Milwaukee Contractor who specializes on dwelling and factory excavations, cleared over $200.00 a day. The machine plows, digs, hauls and loads faster and cheaper than 20 men. Costs a fraction of price of Steam Shovel.





As shown in the diagram of the set-up of this machine, the machine itself never gets into the hole. Neither do the wagons. No snatch teams are needed. A man at the machine and one at the scraper — no more labor required.

Investigate this remarkable opportunity. FIRST—Get complete Catalog. Write for it RIGHT NOW!

THE T. L. SMITH COMPANY

General Sales Offices and Factories: 1189 32d STREET, MILWAUKEE, WIS.

Eastern Office and Warehouse: 50 CHURCH STREET, NEW YORK **Western Warehouse: SAN FRANCISCO**

For convenience in making inquiry use postal inserted in this number.

A Man-Size Shovel

13824 Cu. Yds. per 24 Hrs.

The Bucyrus Shovel, the largest electric shovel in the world, has a capacity of 13824 cu. yds. per 24 hrs. of operation. It operates on a cycle of 45 sec. and handles 8 cu. yds. per cycle.

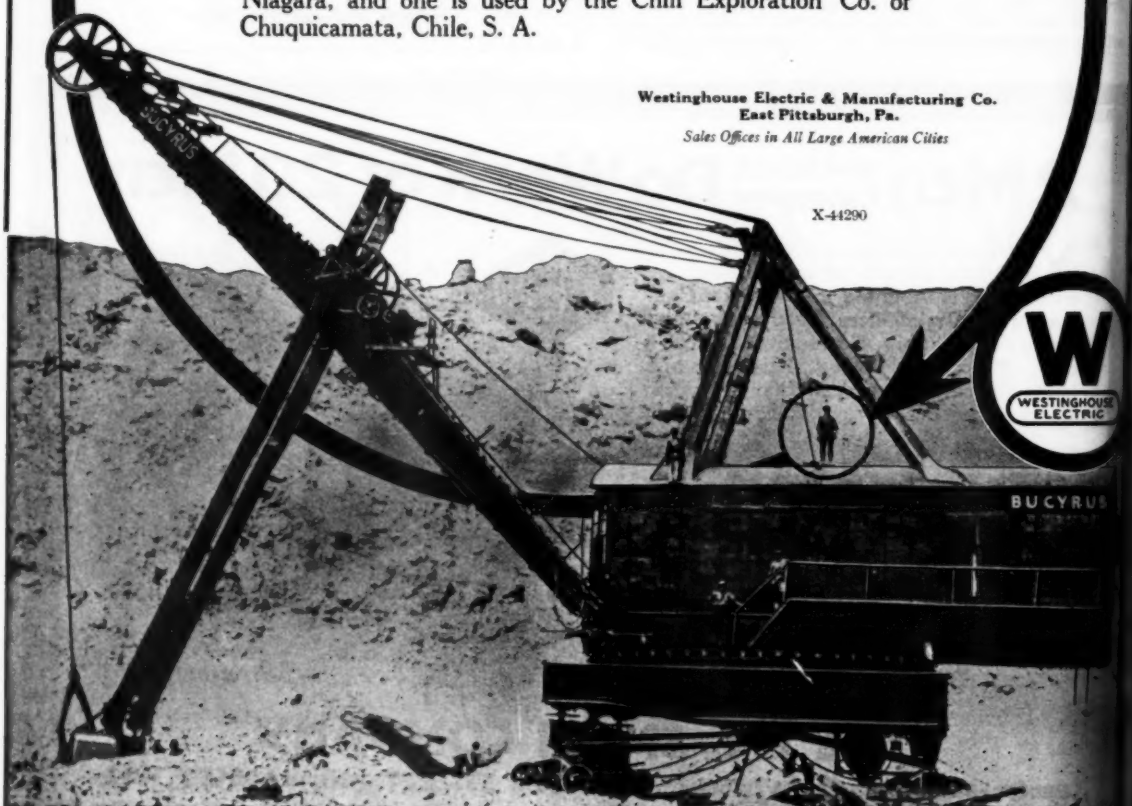
This shovel is equipped with the following Westinghouse A. C. motors:—

Two—250 hp. motors operating the hoist.
One—150 hp. motor operating the swing.
One—150 hp. motor operating the thrust.

Two of these shovels are used by the Hydro Electric Co. of Niagara, and one is used by the Chili Exploration Co. of Chuquicamata, Chile, S. A.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.
Sales Offices in All Large American Cities

X-44290



Westinghouse

For convenience in making inquiry use postal inserted in this number.